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Thermal-Neutron Capture for A = 26-35

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**IAEA NUCLEAR DATA SECTION, WAGRAMER STRASSE 5, A-1400
VIENNA**

Thermal-Neutron Capture Data for A = 26-35

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Abstract: The prompt gamma-ray data of thermal- neutron captures for nuclear mass number A=26-35 had been evaluated and published in "ATOMIC DATA AND NUCLEAR DATA TABLES, 26, 511 (1981)". Since that time the many experimental data of the thermal-neutron captures have been measured and published. The update of the evaluated prompt gamma-ray data is very necessary for use in PGAA of high-resolution analytical prompt gamma-ray spectroscopy. Besides, the evaluation is also very needed in the Evaluated Nuclear Structure Data File, ENSDF, because there are no prompt gamma-ray data in ENSDF. The levels, prompt gamma-rays and decay schemes of thermal-neutron captures for nuclides (26Mg, 27Al, 28Si, 29Si, 30Si, 31P, 32S, 33S, 34S, and 35Cl) with nuclear mass number A=26-35 have been evaluated on the basis of all experimental data. The normalization factors, from which absolute prompt gamma-ray intensity can be obtained, and necessary comments are given in the text. The ENSDF format has been adopted in this evaluation. The physical check (intensity balance and energy balance) of evaluated thermal-neutron capture data has been done. The evaluated data have been put into Evaluated Nuclear Structure Data File, ENSDF. This evaluation may be considered as an update of the prompt gamma-ray from thermal-neutron capture data tables as published in "ATOMIC DATA AND NUCLEAR DATA TABLES, 26, 511 (1981)".

Cutoff Date: March 2001; all references entered into the Nuclear Science References File, NSRF, and private communications have been considered.

$^{26}\text{Mg}(n,\gamma)$ E=thermal 92Wa06

Other: 82Hu02.

Target $J\pi=0^+$.92Wa06: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl) in Compton-suppressed mode and pair spectrometer mode; deduced neutron separation energy $S(n)=6443.40$ keV 5.Other measured $S(n)=6443.39$ keV 55 (82Hu02).Evaluated $S(n)=6443.35$ keV 4 (95Au04).Measured thermal-neutron capture cross section, $\sigma(n,\gamma)=39.0$ mb 8 (92Wa06). **^{27}Mg Levels**

E(level) [‡]	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0.0	1/2+	9.458 min 12	% β^- =100.
984.92 3	3/2+	0.98 ps 7	
1698.63 5	5/2+	0.98 ps 8	
1940.35 8	5/2+	0.76 ps 14	
3476.33 6	1/2+	<7 fs	
3491.47 13	(3/2, 5/2)+	<10 fs	
3561.56 3	3/2-	<7 fs	
3787.39 6	3/2+	<17 fs	
4828.14 4	(1/2, 3/2)-	<7 fs	
5028.58 15	1/2+	<30 fs	
5925.93 18		35 fs 30	
(6443.35 4)	1/2+		E(level): from evaluated $s(n)$ (95Au04). $J\pi$: from s-wave neutron capture. Observed deexcitation intensity is 101% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From $E\gamma$'s using least-squares fit to data, except as noted. **$\gamma(^{27}\text{Mg})$**

All data are from 92Wa06, except as noted.

 $I\gamma$ normalization: renormalized from assuming $I\gamma(\text{to g.s.})=100$.

$E\gamma$	E(level)	$I\gamma^\dagger \#$	Mult. [‡]	δ^\ddagger	Comments
241.6 4	1940.35	0.08 3	(M1)		$\sigma(n,\gamma)=0.03$ mb 1.
517.3 3	(6443.35)	0.62 8			$\sigma(n,\gamma)=0.24$ mb 3.
713.7 [®]	1698.63	<0.08			$\sigma(n,\gamma)<0.03$ mb.
955.45 8	1940.35	0.67 8	M1+E2	-0.08 6	$\sigma(n,\gamma)=0.26$ mb 3.
984.91 3	984.92	15.8 8	M1+E2	+0.22 2	$\sigma(n,\gamma)=6.1$ mb 3.
1040.7 [®]	4828.14	<0.08			$\sigma(n,\gamma)<0.03$ mb.
1266.65 18	4828.14	0.90 8	(M1)		$\sigma(n,\gamma)=0.35$ mb 3.
1336.80 20	4828.14	0.44 6	(E1)		$\sigma(n,\gamma)=0.17$ mb 2.
1351.86 8	4828.14	0.85 8	(E1)		$\sigma(n,\gamma)=0.33$ mb 3.
1414.95 18	(6443.35)	0.44 6			$\sigma(n,\gamma)=0.17$ mb 2.
1467.3 5	5028.58	0.08 3	(E1)		$\sigma(n,\gamma)=0.03$ mb 1.
(1537.2)	5028.58	=0.02584			$\sigma(n,\gamma)=0.01$ mb.
1552.8 7	5028.58	0.05 3	M1		$\sigma(n,\gamma)=0.02$ mb 1.
1615.28 5	(6443.35)	17.1 8			$\sigma(n,\gamma)=6.6$ mb 3.
1621.2 [®]	3561.56	<0.08			$\sigma(n,\gamma)<0.03$ mb.
1698.58 5	1698.63	2.87 18	(E2+M3)	=0.0	$\sigma(n,\gamma)=1.11$ mb 7.
1792.8 [§] 3	3491.47	0.08 3			$\sigma(n,\gamma)=0.03$ mb 1.
1846.95 18	3787.39	0.67 8	M1+E2	-0.0 3	$\sigma(n,\gamma)=0.26$ mb 3.
1862.93 10	3561.56	1.40 11	(E1)		$\sigma(n,\gamma)=0.54$ mb 5.
1939.6 4	1940.35	0.23 6	(E2+M3)	=0.0	$\sigma(n,\gamma)=0.09$ mb 2.
2088.66 11	3787.39	1.06 8			$\sigma(n,\gamma)=0.41$ mb 3.
(2490.7)	3476.33	0.05 3			$\sigma(n,\gamma)=0.02$ mb 1.
2506.57 23	3491.47	0.39 6			$\sigma(n,\gamma)=0.15$ mb 2.
2576.50 6	3561.56	3.51 21	(E1)		$\sigma(n,\gamma)=1.36$ mb 8.
2655.86 6	(6443.35)	3.72 18			$\sigma(n,\gamma)=1.44$ mb 7.
2881.67 4	(6443.35)	66.2 21			$\sigma(n,\gamma)=25.6$ mb 8.
2887.6 [®]	4828.14	<0.08			$\sigma(n,\gamma)<0.03$ mb.
2951.4 4	(6443.35)	0.26 6			$\sigma(n,\gamma)=0.10$ mb 2.
2966.77 22	(6443.35)	2.20 16			$\sigma(n,\gamma)=0.85$ mb 6.
3129.3 [®]	4828.14	<0.08			$\sigma(n,\gamma)<0.03$ mb.

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$^{26}\text{Mg}(n,\gamma)$ E=thermal 92Wa06 (continued) **$\gamma(^{27}\text{Mg})$ (continued)**

$E\gamma$	$E(\text{level})$	$I\gamma^{\dagger\#}$	Mult. [‡]	Comments
3476.19 9	3476.33	3.02 16	M1	$\sigma(n,\gamma)=1.17 \text{ mb}$ 6.
3490.9 6	3491.47	0.26 5		$\sigma(n,\gamma)=0.10 \text{ mb}$ 2.
3561.31 4	3561.56	60.7 18		$\sigma(n,\gamma)=23.5 \text{ mb}$ 7.
3787.05 15	3787.39	1.78 16		$\sigma(n,\gamma)=0.69 \text{ mb}$ 6.
3843.01 8	4828.14	8.1 5	(E1)	$\sigma(n,\gamma)=3.14 \text{ mb}$ 16.
3985.5 6	5925.93	0.10 3		$\sigma(n,\gamma)=0.04 \text{ mb}$ 1.
4043.6 3	5028.58	0.23 6		$\sigma(n,\gamma)=0.09 \text{ mb}$ 2.
4827.67 6	4828.14	5.7 4	(E1)	$\sigma(n,\gamma)=2.20 \text{ mb}$ 13.
4940.5\\$ 3	5925.93	0.10 3		$\sigma(n,\gamma)=0.04 \text{ mb}$ 1.
5457.82 15	(6443.35)	2.51 18		$\sigma(n,\gamma)=0.97 \text{ mb}$ 7.
5924.9 4	5925.93	0.36 6		$\sigma(n,\gamma)=0.14 \text{ mb}$ 2.
6442.50 6	(6443.35)	9.3 5		$\sigma(n,\gamma)=3.59 \text{ mb}$ 17.

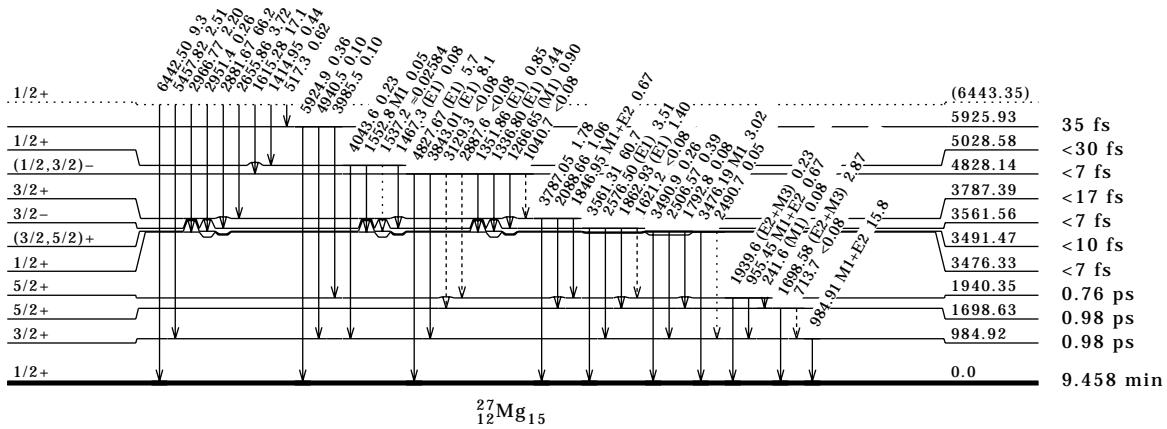
[†] Absolute intensities per 100 neutron captures. For γ -ray cross section in mb, multiply by 0.3906 per 100 neutron captures.

[‡] From adopted gammas.

[§] Presence deduced from the known level energies and branching ratios.

For intensity per 100 neutron captures, multiply by 1.

@ Placement of transition in the level scheme is uncertain.

Level Scheme**Intensities: $I(\gamma+ce)$ per 100 parent decays**

$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14

Other: 90Is05, 82sh027, 81Pr04.

Target $J\pi=1/2^+$.82Sc14: measured $E\gamma$, $I\gamma$ with a Ge(Li) detector, a curved crystal spectrometer GAMS, and a pair spectrometer applying a self-consistent energy calibration. Deduced neutron separation $S(n)=7725.18$ keV δ .Other measured $S(n)=7725.20$ keV δ (80Is02).Evaluated $S(n)=7725.05$ keV δ (95Au04). **^{28}Al Levels**

$E(\text{level})^\ddagger$	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0.0	3+	2.2414 min 12	% β^- =100.
30.8268 7	2+	2.07 ns 5	
972.483 14	0+	33 ps 2	
1013.695 4	3+	105 fs 20	
1373.045 9	1+	220 fs 35	
1620.438 24	1+	85 fs 40	
1623.006 8	2+	85 fs 40	
2139.005 5	2+	55 fs 14	
2201.586 18	1+	45 fs 25	
2271.817 8	4+	20 fs 10	
2486.256 11	2+	70 fs 15	
2565.80 5	(1, 2, 3+)		
2582.06 15	5+	370 fs 40	
2656.172 17	4+	35 fs 14	
2987.66 5	(1, 3)+	60 fs 55	
3296.486 8	3+	100 fs 20	
3347.280 7	2+	100 fs 35	
3465.342 5	4-	62 fs 8	
3591.529 4	3-	70 fs 15	
3670.883 20	3+	130 fs 40	
3709.282 9	(2, 3)+	185 fs 20	
3875.842 6	2-	55 fs 15	
3901.044 15	(1, 3, 5)+	185 fs 30	
3935.658 7	2+	<40 fs	
4244.452 5	2+	40 fs 20	
4461.96 5	(2, 4)+		
4596.601 17	1+	160 fs 85	
4691.191 3	3-	35 fs 9	
4765.010 5	2-	35 fs 9	
4903.615 5	2-	39 fs 6	
5015.525 12	3+		
5134.932 5	3-	28 fs 7	
5177.03 3	(1+, 2, 3+)		
5377.860 24	(1+ to 4+)		
5442.414 6	2-	28 fs 7	
5741.243 9	(1 to 4+)		
5797.636 9	2-		
5860.868 15	(2, 3)+		
6019.706 13	(1+ to 4+)		
6198.932 7	(2+ to 4+)		
6316.862 6	2+		
6419.94 4	(1, 2)+		
6441.481 8	(3+, 4)		
6623.20 3	(1+ to 4+)		
6651.282 22	(0+ to 3+)		
6756.766 22	(2+, 3)		
6893.796 11	(2+, 3)		
7176.542 21	(1+ to 3+)		
7269.545 24	(2+ to 4+)		
(7725.05 6)	2+, 3+		

 $E(\text{level})$: from evaluated $s(n)$ (95Au04). $J\pi$: from s-wave neutron capture.

Observed deexcitation intensity is 101% of g.s. feeding.

† From adopted levels, except as noted.

‡ From 82Sc14 (only the statistical error is given; to obtain the total errors an additional systematic error of 11 ppm has to be added), except as noted.

$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued) **$\gamma(^{28}\text{Al})$**

All data are from 82Sc14, except as noted.

I γ normalization: renormalized from assuming I γ (to g.s.)=100.

E γ	E(level)	I $\gamma^{\dagger\$}$	Mult. ‡	δ^{\ddagger}	Comments
30.8282 7	30.8268	27.9 CA	M1 (+E2)	+0.001 6	I γ : not measured. Value from intensity balance.
(310.2)	2582.06	0.003 1	(M1)		
400.573 22	1373.045	0.63 7	M1		
455.70 5	(7725.05)	0.29 7			
548.69 4	(7725.05)	0.23 3			
647.94 5	1620.438	0.07 4	M1		
831.464 20	(7725.05)	1.3 2			
(863.24)	2486.256	0.10 3			
865.84 5	2486.256	0.54 7			
941.72 3	972.483	1.3 1	E2		
945.34 7	2565.80	0.24 7			
968.49 6	(7725.05)	0.42 6			
982.968 23	1013.695	4.4 5	M1+E2	+0.13 5	
1013.605 25	1013.695	2.7 3	(M1)		
1073.99 5	(7725.05)	0.57 7			
1102.08 4	(7725.05)	0.7 2			
1125.266 14	2139.005	0.38 7			
1173.440 9	4765.010	0.39 9			
1193.500 23	3465.342	0.6 1	(E1)		
(1283.54 7)	2656.172	1.1 1			
1283.70# 3	(7725.05)	1.1# 1			
1305.30 12	(7725.05)	0.19 5			
1342.280 18	1373.045	1.0 1	M1+E2	-0.14 9	
1364.62 14	2987.66	0.38 6			
1372.917 18	1373.045	0.15 8	(E2)		
1408.346 9	(7725.05)	3.1 3			
(1437.40)	3709.282	0.27 6			
(1513.75)	2486.256	0.05 2			
1526.258 12	(7725.05)	1.8 2			
(1570.24)	3709.282	0.19 6			
1589.64 5	1620.438	1.6 2	M1+E2	+0.18 9	
1592.235 18	1623.006	0.36 5			
(1620.26)	1620.438	0.1			
1622.871 18	1623.006	4.6 5			
1642.41 3	2656.172	0.30 5	(M1)		
1673.411 22	3296.486	0.23 3			
1705.52 4	(7725.05)	0.39 5			
1720.0# 3	5015.525	0.08# 5			
	6316.862	0.08# 5			
	6623.20	0.08# 5			
1864.33 3	(7725.05)	0.46 7			
1927.56 3	(7725.05)	1.2 2			
x1963.68 20		0.05 1			
1968.452 19	3591.529	0.10 1	(E1)		
1975.2# 5	2987.66	0.025# 8			
	3347.280	0.025# 8			
	4461.96	0.025# 8			
	5442.414	0.025# 8			
1983.990 13	(7725.05)	1.1 1			
2047.77 4	3670.883	0.07 1			
2108.192 11	2139.005	2.8 1			
2128.70 3	6893.796	0.34 2			
2138.828 9	2139.005	2.2 1			
2170.74 3	2201.586	0.45 3			
2247.39 3	4903.615	0.040 6			
2255.36 5	3875.842	0.55 4	E1		
2271.667 16	2271.817	2.1 1			
2276.7# 11	3901.044	0.04# 3			
	4765.010	0.04# 3			
	5741.243	0.04# 3			
x2279.1 7		0.08 3			

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$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued) **$\gamma(^{28}\text{Al})$ (continued)**

E γ	E(level)	I $\gamma^{\dagger\$}$	Mult. ‡	Comments
2282.804 15	(7725.05)	4.7 2		
x2299.94 10		0.12 1		
2312.56 5	3935.658	0.035 6		
2347.27 4	(7725.05)	0.16 1		
x2380.34 5		0.21 1		
x2384.3 3		0.034 6		
2419.22 3	4691.191	0.14 1	(E1)	
2451.554 18	3465.342	0.39 2	(E1)	
2455.42 3	2486.256	0.036 7		
2486.058 19	2486.256	0.18 1	E2	
2502.71 4	3875.842	0.16 1	E1	
2534.92 16	2565.80	0.084 8		
2548.09 5	(7725.05)	0.15 1		
2552.060 10	4691.191	0.094 8	(E1)	
2563.32 3	4765.010	0.10 1		
x2567.8 3		0.70 1		
2577.696 13	3591.529	2.2 1	(E1)	
2581.90 19	2582.06	0.05 1	(E2)	
2590.212 17	(7725.05)	4.2 2		I γ : 3.9 2 (90Is05).
2625.866 23	4765.010	1.37 7	(E1)	
x2656.34 7		0.16 1		
2690.65 5	5177.03	0.029 6		
2709.62 4	(7725.05)	0.69 4		
x2717.4 4		0.021 5		
2725.206 13	6316.862	0.021 6		
x2728.27 5		0.27 1		
x2733.64 3		0.38 2		
2743.51 3	5015.525	0.045 6		
2821.454 7	(7725.05)	3.9 2		
2862.000 11	3875.842	0.038 6		
2876.44 11	5442.414	0.116 8		
2880.73 7	6756.766	0.027 5		
2887.208 25	3901.044	0.23 1		
x2893.87 17		0.049 6		
2903.24 3	3875.842	0.011 5		
2921.795 17	3935.658	0.28 1		
2954.38 18	6419.94	0.23 3		
2960.099 10	(7725.05)	9.6 5		I γ : 9.2 4 (90Is05), 9.0 14 (82Sh27), 9.63 19 (81Pr04).
2973.42 7	4596.601	0.024 3		
2987.41 7	2987.66	0.32 4		
3017.75 3	6893.796	0.06 2		
3020.235 15	6316.862	0.07 2		
3024.89 13	7269.545	0.05 2		
3033.904 6	(7725.05)	8.8 4		I γ : 8.7 4 (90Is05), 7.28 11 (82Sh27), 8.99 18 (81Pr04).
x3053.6 4		0.021 5		
3068.00 3	4691.191	0.081 3		
x3075.65 9		0.083 6		
3128.48 3	(7725.05)	0.24 1		
x3142.22 6		0.16 1		
x3191.20 12		0.048 3		
x3208.27 7		0.092 6		
3222.73 4	6893.796	0.049 3		
3230.59 8	4244.52	0.027 3		
3254.736 23	5741.243	0.022 3		
3263.06 8	(7725.05)	0.10 1		
3265.544 17	3296.486	0.42 3		
3303.153 9	5442.414	1.14 6	(E1)	
3316.341 12	3347.280	0.025 3		
3346.975 12	3347.280	0.50 3		
x3375.08 24		0.026 3		
3391.74 5	4765.010	0.57 3	(E1)	
3409.26 5	6756.766	0.023 3		
3448.06 8	4461.96	0.032 5		

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$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued) **$\gamma(^{28}\text{Al})$ (continued)**

E γ	E(level)	I $\gamma^{\dagger\$}$	Mult. ‡	Comments
3465.063 7	3465.342	7.0 4	(E1)	I γ : 7.1 3 (90Is05), 7.25 15 (81Pr04).
x3472.3 3		0.06 1		
3480.54 12	(7725.05)	0.12 1		
3560.567 7	3591.529	0.93 5	(E1)	
x3569.9 3		0.036 6		
3591.201 6	3591.529	4.7 2	(E1)	I γ : 4.7 2 (90Is05), 4.86 10 (81Pr04).
3598.46 10	7269.545	0.15 1		
3623.88 7	4596.601	0.086 6	M1	
3635.24 8	6623.20	0.010 3		
3639.88 4	3670.883	0.073 5		
3659.06 3	5860.868	0.064 5		
x3671.22 8		0.070 5		
3678.32 3	3709.282	0.31 2		
x3702.22 7		0.078 5		
3708.953 15	3709.282	0.45 2		
3721.60 3	5860.868	0.030 3		
x3725.1 3		0.024 3		
3750.83# 18	4765.010	0.035# 3		
	6316.862	0.035# 3		
3754.62 4	5377.860	0.043 3		
3768.82 9	6756.766	0.013 2		
3789.322 11	(7725.05)	0.87 4		
3803.74 5	5177.03	0.011 3		
3821.67 8	5442.414	0.033 8		
3823.908 24	(7725.05)	0.56 3		
3849.114 7	(7725.05)	3.1 2		
3859.1 3	6441.481	0.046 6		
x3865.7 4		0.027 6		
3875.495 10	3875.842	2.7 1		
x3881.8 4		0.027 6		
3889.659 12	4903.615	0.23 1		
3900.701 24	3901.044	0.23 1		
3904.653 14	3935.658	0.20 1		
3926.816 19	6198.932	0.023 3		
3935.287 11	3935.658	0.33 2		
x3949.8 4		0.014 2		
4001.49 8	5015.525	0.135 8		
4015.655 10	(7725.05)	0.73 4		
x4023.21 5		0.138 8		
4044.716 22	6316.862	0.023 2		
4054.09 4	(7725.05)	0.143 8		
4059.647 14	6198.932	0.030 3		
4069.007 19	5442.414	0.157 8		
4085.17 8	6651.282	0.008 2		
4100.26 15	6756.766	0.016 5		
4119.9# 4	5134.932	0.040# 8		
	5741.243	0.040# 8		
x4125.09 22		0.088 9		
4133.406 6	(7725.05)	6.9 3		I γ : 7.0 3 (90Is05), 7.53 113 (82Sh27), 7.37 15 (81Pr04).
4162.4# 5	5134.932	0.019# 5		
	5177.03	0.019# 5		
4169.347 19	6441.481	0.122 7		
x4175.06 23		0.030 3		
x4185.23 10		0.064 5		
4213.43 8	4244.52	0.056 3		
4218.04 7	6419.94	0.027 3		
4237.43# 10	5860.868	0.060# 5		
	6893.796	0.060# 5		
4259.539 6	(7725.05)	6.8 3		I γ : 7.0 3 (90Is05), 6.16 95 (82Sh27), 7.37 15 (81Pr04).
4270.14 5	6756.766	0.054 7		
4280.58 15	6419.94	0.17 1		
x4330.75 12	(7725.05)	0.052 3		
4377.624 12		0.43 2		

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$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued) **$\gamma(^{28}\text{Al})$ (continued)**

E γ	E(level)	I $\gamma^{\dagger\$}$	Mult. ‡	Comments
x4384.1 4		0.010 2		
4396.32 4	6019.706	0.058 3		
4424.221 20	5797.636	0.36 2		
4428.418 12	(7725.05)	0.81 4		
x4447.27 19		0.019 2		
4461.54 8	4461.96	0.042 3		
4484.52 5	6756.766	0.071 5		
4511.86 4	6651.282	0.084 5		
4565.47 3	4596.601	0.027 2		
4575.555 17	6198.932	0.30 2		
x4582.21 11		0.041 3		
4596.11 3	4596.601	0.124 7		
4612.98 6	7269.545	0.016 2		
x4617.77 12		0.082 6		
4621.53 3	6893.796	0.19 1		
4660.046 5	4691.191	2.6 1	(E1)	I γ : 2.6 1 (90Is05).
4690.678 5	4691.191	4.6 2	(E1)	I γ : 4.8 2 (90Is05), 4.99 10 (81Pr04).
4733.846 7	4765.010	5.5 3	(E1)	
4737.17 18	(7725.05)	0.45 2		
4754.35 6	6893.796	0.38 2		
4764.479 8	4765.010	0.91 5		
x4769.61 15		0.113 9		
4783.485 18	5797.636	0.011 3		
x4812.54 17		0.031 2		
x4868.80 9		0.058 3		
4903.113 6	4903.615	3.1 2	(E1)	I γ : 3.3 2 (90Is05).
x4965.8 4		0.009 1		
4984.308 17	5015.525	0.113 6		
x4996.64 7		0.064 3		
5005.504 24	6019.706	0.048 3		
5014.940 21	5015.525	0.003 1		
x5031.51 17		0.017 1		
5068.60 3	(7725.05)	0.173 9		
5103.702 7	5134.932	0.39 2		
5130.06 11	7269.545	0.107 9		
5134.334 7	5134.932	3.0 1	(E1)	I γ : 3.2 2 (90Is05), 3.26 6 (81Pr04).
5142.6 4	(7725.05)	0.015 2		
5176.45 5	5177.03	0.070 3		
5184.74 3	6198.932	0.030 2		
x5203.54 21		0.017 1		
x5209.30 24		0.022 2		
x5213.4 5		0.009 2		
x5228.4 4		0.008 1		
5238.478 19	(7725.05)	0.26 1		
x5269.91 6		0.057 3		
5277.68 5	6651.282	0.021 1		
5302.632 12	6316.862	0.47 2		
x5315.14 12		0.031 2		
5343.87 6	6316.862	0.017 1	E2	
5377.25 4	5377.860	0.080 5		
5411.077 7	5442.414	2.0 1	(E1)	
5427.257 13	6441.481	0.087 5		
5441.70 7	5442.414	0.015 2	(E1)	
5446.90 7	6419.94	0.035 2		
5452.84 4	(7725.05)	0.168 9		
x5459.39 18		0.021 2		
5523.13 7	(7725.05)	0.064 3		
x5564.6 5		0.007 1		
5585.667 23	(7725.05)	1.10 5		
x5594.7 4		0.009 1		
5709.852 13	5741.243	0.56 3		
x5719.14 16		0.022 2		
x5729.6 4		0.008 1		

Continued on next page (footnotes at end of table)

$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued) **$\gamma(^{28}\text{Al})$ (continued)**

E γ	E(level)	I $\gamma^{\dagger\$}$	Comments
x5748.2 14		0.002 2	
x5760.57 24		0.023 2	
5766.272 17	5797.636	0.38 2	
5796.904 17	5797.636	0.124 7	
5802.89 5	7176.542	0.035 2	
5829.49 4	5860.868	0.013 1	
5860.12 3	5860.868	0.155 8	
5879.42 3	6893.796	0.026 2	
x5882.6 6		0.009 2	
x5923.42 7		0.043 2	
x5969.54 15		0.023 2	
5988.284 23	6019.706	0.023 2	
6018.92 3	6019.706	0.187 9	
6101.54 5	(7725.05)	2.6 1	I γ : 2.7 1 (90Is05), 2.71 6 (81Pr04).
x6109.6 7		0.010 2	
x6121.3 5		0.011 2	
6162.13 4	7176.542	0.013 2	
6198.141 11	6198.932	0.67 3	I γ : 0.70 3 (90Is05).
x6210.8 3		0.013 1	
6255.10 5	7269.545	0.014 1	
x6289.6 8		0.003 1	
6316.031 12	6316.862	2.0 1	
x6329.5 8		0.008 2	
6351.45 4	(7725.05)	0.109 6	
x6390.2 5		0.008 1	
6419.06 12	6419.94	0.006 1	
6440.651 11	6441.481	0.66 3	I γ : 0.71 3 (90Is05).
x6449.5 5		0.007 1	
x6459.69 22		0.016 1	
6591.61 4	6623.20	0.164 9	
6619.69 4	6651.282	0.24 2	
6622.24 9	6623.20	0.19 2	
x6628.4 5		0.011 2	
6710.692 7	(7725.05)	0.90 5	
6725.16 5	6756.766	0.086 5	
6751.93 8	(7725.05)	0.058 3	
x6800.7 3		0.022 2	
x6823.03 11		0.055 3	
6862.16 3	6893.796	0.173 9	
x6894.27 17		0.031 2	
x6936.97 5		0.124 7	
x7135.24 12		0.054 3	
7175.50 4	7176.542	0.133 4	
7237.83 10	7269.545	0.087 5	
7268.46 5	7269.545	0.038 2	
x7342.25 11		0.060 3	
x7377.0 3		0.021 2	
x7407.73 11		0.065 5	
7693.407 4	(7725.05)	3.3 2	I γ : 3.6 2 (90Is05), 5.8 (82Sh27).
7724.036 4	(7725.05)	26.8 1	I γ : 29.5 7 (90Is05), 25.1 67 (82Sh27), 32.1 6 (81Pr04).

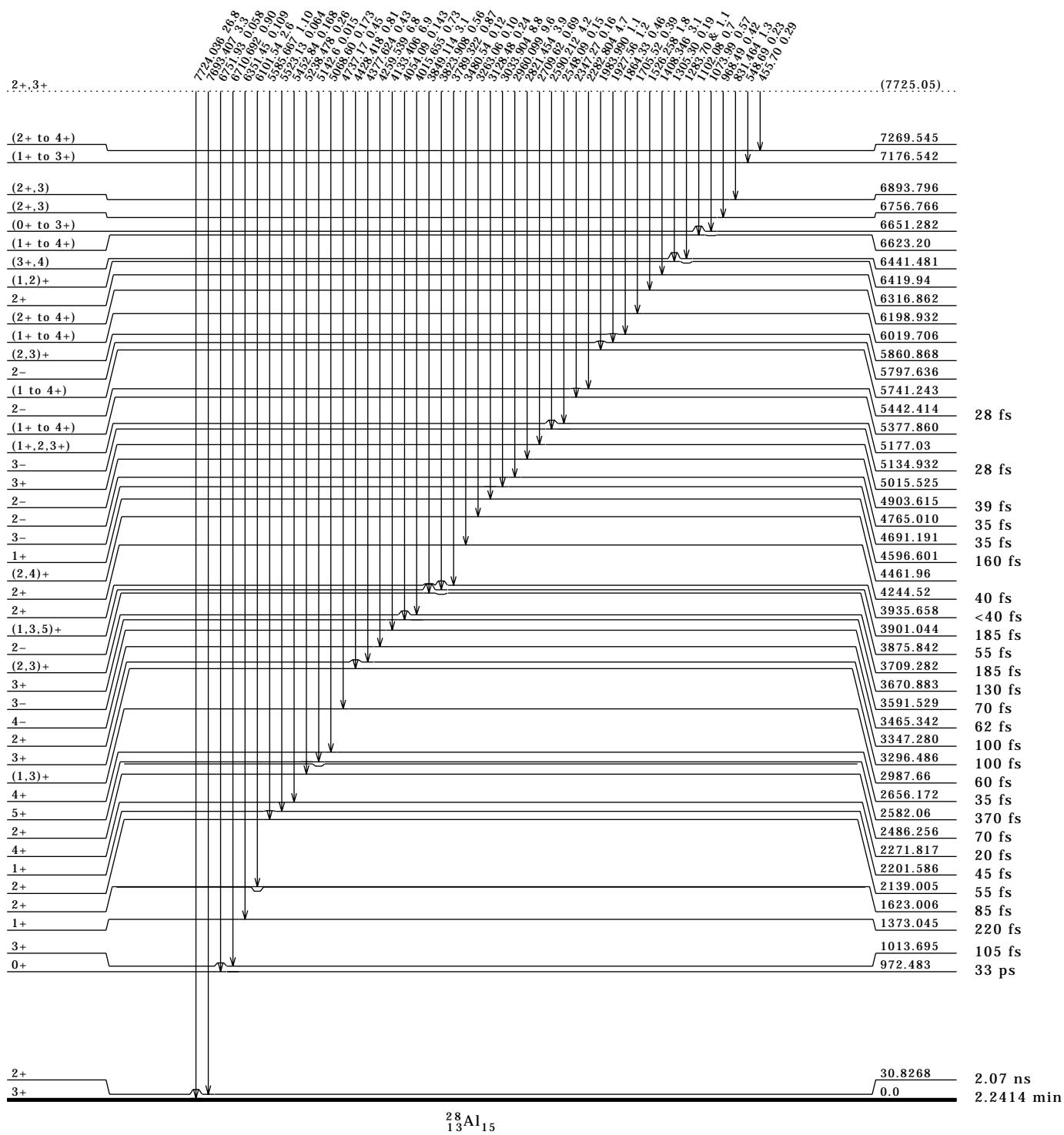
[†] Absolute intensities per 100 neutron captures.[‡] From adopted gammas.[§] For intensity per 100 neutron captures, multiply by 1.

Multiply placed; undivided intensity given.

x γ ray not placed in level scheme.

$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued)**Level Scheme**

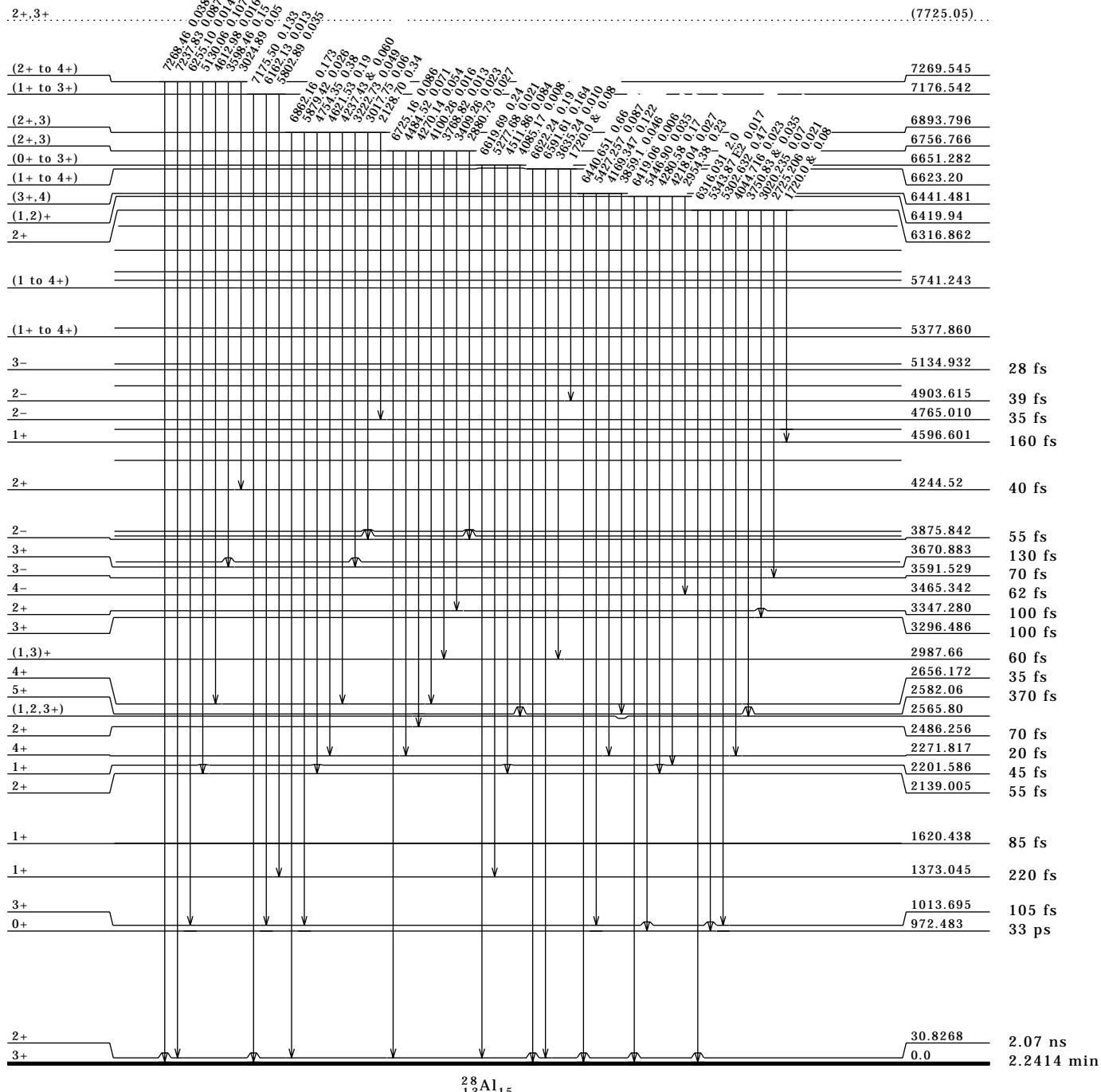
Intensities: $I(\gamma+\text{ce})$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued)

Level Scheme (continued)

Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given

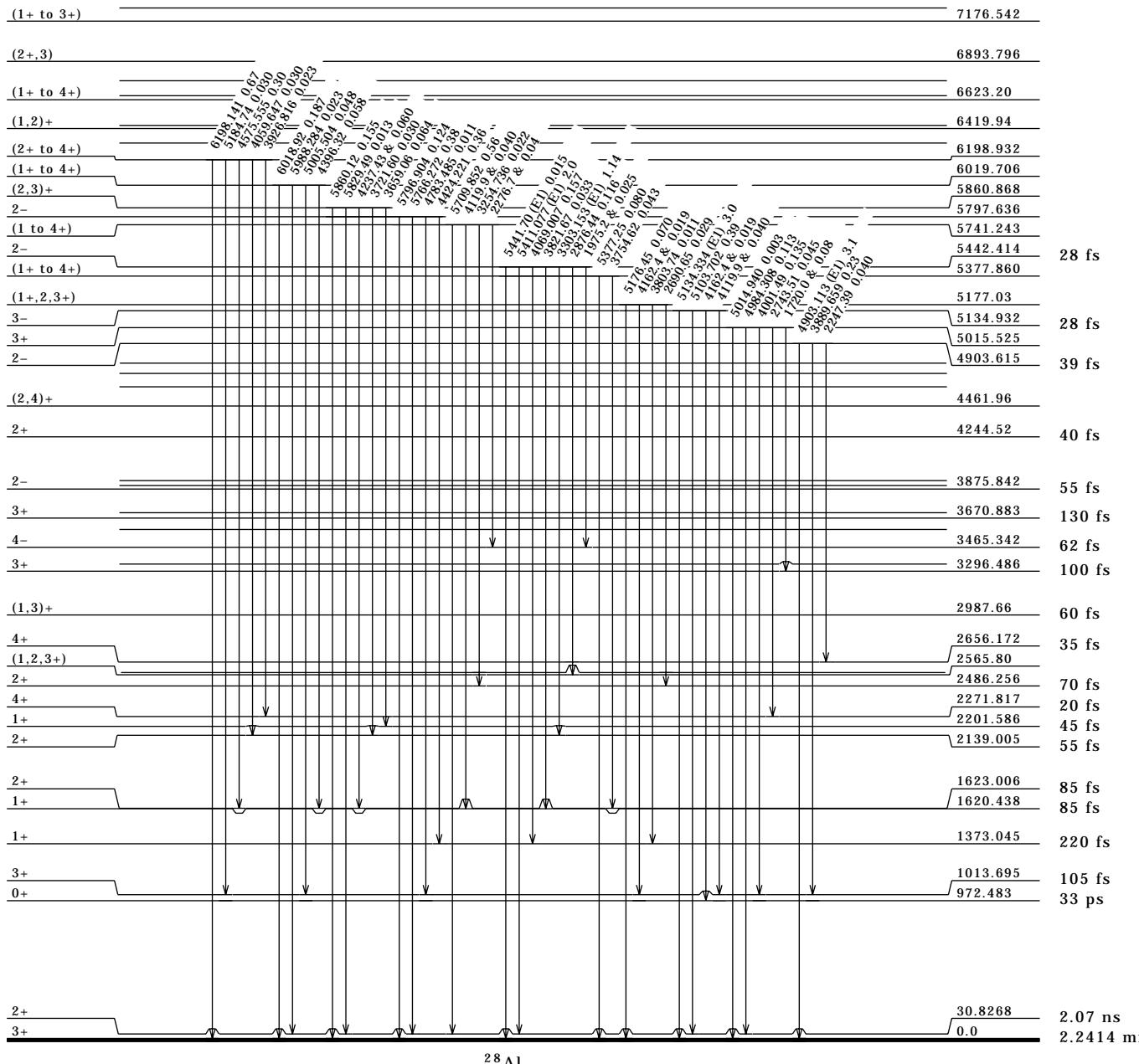


$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued)

Level Scheme (continued)

Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given

2+, 3+ (7725.05)



$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued)

Level Scheme (continued)

Intensities: $I(\gamma+\text{ce})$ per 100 parent decays
 & Multiply placed; undivided intensity given

2+, 3+ (7725.05)

(1+ to 3+) 7176.542

(2+, 3) 6893.796

(1+ to 4+) 6623.20

(1,2)+ 6419.94

(2+ to 4+) 6198.932

(1+ to 4+) 6019.706

(1 to 4+) 5741.243

(1+ to 4+) 5377.860

3- 5134.932 28 fs

2- 4765.010 35 fs

3- 4691.191 35 fs

1+ 4596.601 160 fs

(2,4)+ 4461.96

2+ 4244.52

2+ 3935.658 <40 fs

(1,3,5)+ 3901.044 185 fs

2- 3875.842 55 fs

(2,3)+ 3709.282 185 fs

3+ 3670.883 130 fs

3- 3591.529 70 fs

4- 3465.342 62 fs

2+ 3347.280 100 fs

3+ 3296.486 100 fs

2+ 2486.256 70 fs

4+ 2271.817 20 fs

1+ 2201.586 45 fs

2+ 2139.005 55 fs

2+ 1623.006 85 fs

1+ 1620.438 85 fs

1+ 1373.045 220 fs

3+ 1013.695 105 fs

0+ 972.483 33 ps

2+ 30.8268 2.07 ns

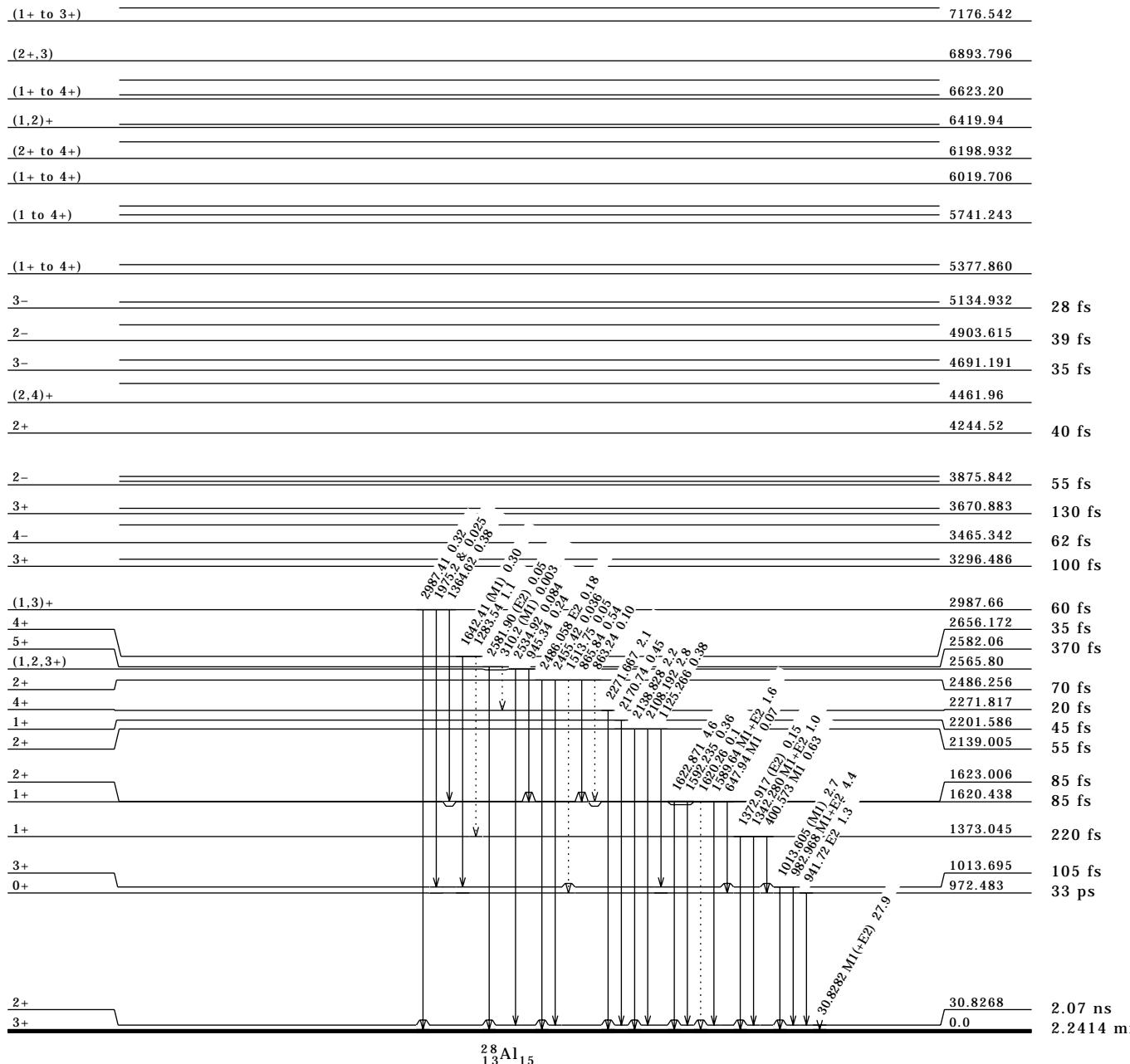
3+ 0.0 2.2414 min

$^{27}\text{Al}(\text{n},\gamma)$ E=thermal 82Sc14 (continued)

Level Scheme (continued)

Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given

$2+, 3+$ (7725.05).....



$^{28}\text{Si}(n,\gamma)$ E=thermal 92Ra19,90Is02

Others: 90Is02, 90Is05.

Target $J\pi=0^+$.92Ra19: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl) in Compton-suppressed mode and pair spectrometer mode. Deduced neutron separation energy $S(n)=8473.56$ keV 4.Other measured $S(n)=8473.61$ keV 4 (90Is02).Evaluated $S(n)=8473.55$ keV 3 (95Au04).Measured thermal-neutron capture cross section, $\sigma(n,\gamma)=169$ mb 4 (92Ra19), 207 mb 4 (90Is02,90Is05). **^{29}Si Levels**

E(level) [‡]	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0.0	$1/2^+$	stable	
1273.375 22	$3/2^+$	290 fs 10	
2028.04 7	$5/2^+$	306 fs 10	
2425.86 3	$3/2^+$	18.4 ps 11	
3066.98 4	$5/2^+$	32 fs 2	
4840.34 7	$1/2^+$	<3 fs	
4934.389 22	$3/2^-$	0.48 fs 12	
6380.575 24	$1/2^-$	0.36 fs 11	
6712.9 5	$3/2$		
6908.52 6	($1/2^+, 3/2$)		
7058.00 9	$1/2^+$	<15 fs	
7523.19 13	($1/2, 3/2$)	<15 fs	
7996.9 3	$3/2^-$		
(8473.55 3)	$1/2^+$		E(level): from evaluated $S(n)$ (95Au04). $J\pi$: from s-wave neutron capture. Observed deexcitation intensity is 100% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From $E\gamma$'s using least-squares fit to data, except as noted. **$\gamma(^{29}\text{Si})$**

All data are from 92Ra19, except as noted.

 $I\gamma$ normalization: renormalized from assuming $I\gamma(\text{to g.s.})=100$. $\sigma(n,\gamma)=0.177$ 5.

$E\gamma$	E(level)	$I\gamma^\dagger\#$	Mult. [‡]	δ^\ddagger	Comments
397.7 4	2425.86	0.018 6	(M1)		$\sigma(n,\gamma)=0.03$ mb 1 (92Ra19).
476.6 3	(8473.55)	0.059 12			$\sigma(n,\gamma)=0.10$ mb 2 (92Ra19).
(641.25)	3066.98	0.017 9			$\sigma(n,\gamma)=0.029$ mb 15.
754.2 4	2028.04	0.030 12	M1+E2	-0.03 3	$\sigma(n,\gamma)=0.05$ mb 2 (92Ra19).
950.33 13	(8473.55)	0.071 12			$\sigma(n,\gamma)=0.12$ mb 2 (92Ra19).
1038.89 10	3066.98	0.136 18	M1+E2	+0.04 2	$\sigma(n,\gamma)=0.23$ mb 3 (92Ra19).
x1071.0 5		0.047 12			$\sigma(n,\gamma)=0.08$ mb 2 (92Ra19).
1152.46 6	2425.86	0.528 24	M1+E2	+0.009 8	$\sigma(n,\gamma)=0.89$ mb 4 (92Ra19).
1273.33 3	1273.375	16.9 9	M1+E2	+0.197 9	$\sigma(n,\gamma)=28.5$ mb 14 (92Ra19).
1415.54 9	(8473.55)	0.213 24			$\sigma(n,\gamma)=0.36$ mb 4 (92Ra19).
1446.14 4	6380.575	0.79 3	(M1)		$\sigma(n,\gamma)=1.34$ mb 5 (92Ra19).
1540.18 6	6380.575	0.35 3	(E1)		$\sigma(n,\gamma)=0.59$ mb 5 (92Ra19).
1564.99 5	(8473.55)	0.52 4			$I\gamma$: 0.52 13 (90Is02).
1760.4 5	(8473.55)	0.042 12			$\sigma(n,\gamma)=0.87$ mb 6 (92Ra19).
1793.51 4	3066.98	0.66 4	M1+E2	+0.26 2	$\sigma(n,\gamma)=0.07$ mb 2 (92Ra19).
1867.29 5	4934.389	0.77 4	(E1)		$I\gamma$: 0.55 8 (90Is02).
2027.98 9	2028.04	0.44 5	E2 (+M3)	=0.0	$\sigma(n,\gamma)=1.12$ mb 6 (92Ra19).
2092.89 3	(8473.55)	19.6 8	E1 [§]		$I\gamma$: 0.84 8 (90Is02).
2123.8 6	7058.00	0.024 6	(E1)		$\sigma(n,\gamma)=33.0$ mb 12 (92Ra19).
2425.73 4	2425.86	3.00 12	M1+E2	-0.32 7	$\sigma(n,\gamma)=0.04$ mb 1 (92Ra19).
2508.24 13	4934.389	0.25 3			$\sigma(n,\gamma)=5.06$ mb 20 (92Ra19).
					$I\gamma$: 0.21 2 (90Is02).
					$\sigma(n,\gamma)=0.42$ mb 5 (92Ra19).

Continued on next page (footnotes at end of table)

$^{28}\text{Si}(\text{n},\gamma)$ E=thermal 92Ra19,90Is02 (continued) **$\gamma(^{29}\text{Si})$ (continued)**

E γ	E(level)	I $\gamma^{\dagger\#}$	Mult. ‡	δ^{\ddagger}	Comments
2906.2 5	4934.389	0.042 12			$\sigma(n,\gamma)=0.07 \text{ mb } 2$ (92Ra19).
3538.98 4	(8473.55)	70.3 22	E1 \$		$I_{\gamma}: 69.74 \text{ } 70$ (90Is02).
3566.5 5	4840.34	0.036 12			$\sigma(n,\gamma)=118.5 \text{ mb } 36$ (92Ra19).
3633.0 @	(8473.55)	<0.071			$\sigma(n,\gamma)=0.06 \text{ mb } 2$ (92Ra19).
3660.80 6	4934.389	4.09 18	(E1)		$\sigma(n,\gamma)<0.12 \text{ mb }$ (92Ra19).
3841.4 6	6908.52	0.042 12			$I_{\gamma}: 4.05 \text{ } 4$ (90Is02).
3954.44 5	6380.575	2.61 18	(E1)		$\sigma(n,\gamma)=6.9 \text{ mb } 3$ (92Ra19).
4482.1 4	6908.52	0.11 3			$\sigma(n,\gamma)=0.07 \text{ mb } 2$ (92Ra19).
4632.3 7	7058.00	0.024 12			$I_{\gamma}: 2.40 \text{ } 3$ (90Is02).
4839.6 4	4840.34	0.24 3	M1		$\sigma(n,\gamma)=4.4 \text{ mb } 3$ (92Ra19).
4880.2 5	6908.52	0.18 3			$I_{\gamma}: 0.11 \text{ } 1$ (90Is02).
4933.98 3	4934.389	65.7 21	E1 (+M2)	-0.05 10	$\sigma(n,\gamma)=0.18 \text{ mb } 5$ (92Ra19).
5096.4 7	7523.19	0.042 12			$\sigma(n,\gamma)=0.04 \text{ mb } 2$ (92Ra19).
5106.74 6	6380.575	3.68 18	(E1)		$I_{\gamma}: 0.24 \text{ } 2$ (90Is02).
5405.4 9	(8473.55)	0.036 12	E2 \$		$\sigma(n,\gamma)=0.40 \text{ mb } 5$ (92Ra19).
5634.4 4	6908.52	0.125 18			$I_{\gamma}: 0.15 \text{ } 2$ (90Is02).
5784.7 7	7058.00	0.018 6			$\sigma(n,\gamma)=0.30 \text{ mb } 5$ (92Ra19).
6046.91 16	(8473.55)	0.33 4			$I_{\gamma}: 62.49 \text{ } 65$ (90Is02).
6379.80 4	6380.575	11.3 6	E1		$\sigma(n,\gamma)=110.8 \text{ mb } 34$ (92Ra19).
6444.9 5	(8473.55)	0.119 24	E2 \$		$\sigma(n,\gamma)=0.07 \text{ mb } 2$ (92Ra19).
6711.4 9	6712.9	0.030 12			$I_{\gamma}: 3.55 \text{ } 4$ (90Is02).
6907.6 7	6908.52	0.059 18			$\sigma(n,\gamma)=6.2 \text{ mb } 3$ (92Ra19).
7056.9 4	7058.00	0.16 3	M1		$I_{\gamma}: 0.020 \text{ } 3$ (90Is02).
7199.20 5	(8473.55)	7.1 3			$\sigma(n,\gamma)=0.06 \text{ mb } 2$ (92Ra19).
7521.8 9	7523.19	0.012 6			$I_{\gamma}: 0.15 \text{ } 1$ (90Is02).
7994.9 9	7996.9	0.018 6			$\sigma(n,\gamma)=0.55 \text{ mb } 6$ (92Ra19).
8472.2223 5	(8473.55)	2.17 12			$I_{\gamma}: 11.04 \text{ } 13$ (90Is02).
					$\sigma(n,\gamma)=19.0 \text{ mb } 10$ (92Ra19).
					$I_{\gamma}: 0.13 \text{ } 1$ (90Is02).
					$\sigma(n,\gamma)=0.20 \text{ mb } 4$ (92Ra19).
					$I_{\gamma}: 0.040 \text{ } 5$ (90Is02).
					$\sigma(n,\gamma)=0.05 \text{ mb } 2$ (92Ra19).
					$I_{\gamma}: 0.15 \text{ } 1$ (90Is02).
					$\sigma(n,\gamma)=0.27 \text{ mb } 5$ (92Ra19).
					$I_{\gamma}: 6.81 \text{ } 7$ (90Is02).
					$\sigma(n,\gamma)=11.9 \text{ mb } 5$ (92Ra19).
					$I_{\gamma}: 0.020 \text{ } 3$ (90Is02).
					$\sigma(n,\gamma)=0.02 \text{ mb } 1$ (92Ra19).
					$I_{\gamma}: 0.020 \text{ } 4$ (90Is02).
					$\sigma(n,\gamma)=0.03 \text{ mb } 1$ (92Ra19).
					E γ : from 97Ro26.
					$I_{\gamma}: 2.12 \text{ } 2$ (90Is02).
					$\sigma(n,\gamma)=3.66 \text{ mb } 20$ (92Ra19).

[†] Absolute intensities per 100 neutron captures. For γ -ray cross section in mb (92Ra19), multiply by 1.6892 per 100 neutron captures.

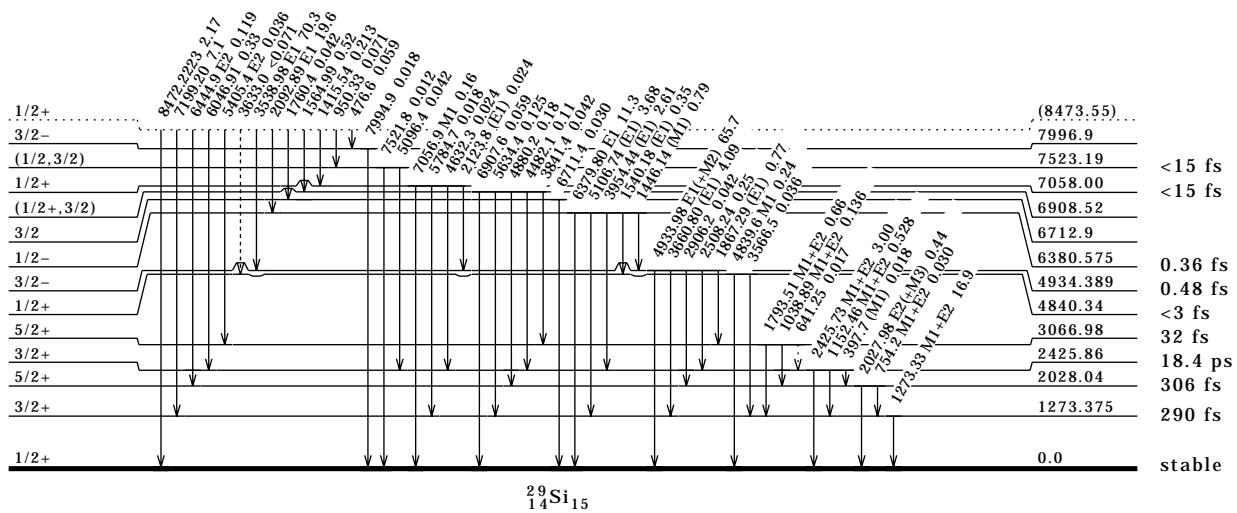
[‡] From adopted gammas, except as noted.

^{\$} From 92Ra19.

[#] For intensity per 100 neutron captures, multiply by 1.

[@] Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

$^{28}\text{Si}(\text{n},\gamma)$ E=thermal 92Ra19,90Is02 (continued)**Level Scheme**Intensities: $I(\gamma+\text{ce})$ per 100 parent decays **$^{29}\text{Si}(\text{n},\gamma)$ E=thermal 92Ra19,90Is02**

Others: 90Is02, 90Is05.

Target $J\pi=1/2^+$.92Ra19: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl) in Compton-suppressed mode and pair spectrometer mode. Deduced neutron separation energy $S(n)=10609.24$ keV 5.Other measured $S(n)=10609.21$ keV 4 (90Is02).Evaluated $S(n)=10609.18$ keV 3 (95Au04).Measured thermal-neutron capture cross section, $\sigma(n,\gamma)=119$ mb 3 (92Ra19), 120 mb 3 (90Is02, 90Is05). **^{30}Si Levels**

E(level) [‡]	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0 . 0	0 +	stable	
2235 . 308 23	2 +	248 fs 12	
3498 . 51 4	2 +	58 fs 5	
3769 . 47 4	1 +	36 fs 9	
3787 . 70 5	0 +	8 . 3 ps 5	
4810 . 34 11	2 +	107 fs 14	
4830 . 84 4	3 +	94 fs 17	
5231 . 55 7	3 +	55 fs 14	
5280 . 0			
5372 . 2 § 6	0 +	60 fs 20	
5487 . 55 6	3 -	49 fs 14	
5614 . 01 12	2 +	<14 fs	
6641 . 19 6	2 -	23 fs 8	
6744 . 06 3	1 -	0 . 6 fs 2	
6914 . 78 19	2 +	<24 fs	
7507 . 86 4	2 -	<25 fs	
7667 . 2 4	(1 , 2) +	<14 fs	
8104 . 8 3	2 +	<25 fs	
8154 . 8 3	(1 - to 4 +)		
8163 . 18 4	1 -		
8898 . 07 10	1 -		
8936 . 5 # 3	2 +		

Continued on next page (footnotes at end of table)

$^{29}\text{Si}(\text{n},\gamma)$ E=thermal 92Ra19,90Is02 (continued) **^{30}Si Levels (continued)**

E(level) [‡]	Jπ [†]	T _{1/2} [†]	Comments
8953.29 12	(1, 2+)		
9103.72 4	(0 to 2)-	<25 fs	
9308.07 6	(0 to 3+)	<25 fs	
9597.17 9			
9619.76 6	1-	0.13 fs 5	
9792.34 6	1-	0.07 fs 2	
10202.08 8	1-	0.05 fs 3	
10275.8 3	(0+ to 4+)		
(10609.18 3)	0+, 1+		E(level): from evaluated S(n) (95Au04). Jπ: from s-wave neutron capture. Observed deexcitation intensity is 77% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From Eγ's using least-squares fit to data, except as noted.

§ γ-rays feeding this level were sought but not observed.

γ-ray deexciting this level were sought but not observed.

 $\gamma(^{30}\text{Si})$

All data are from 92Ra19, except as noted.

Iγ normalization: renormalized from assuming Iγ(to g.s.)=100.

Eγ	E(level)	Iγ ^{†#}	Mult. [‡]	δ [‡]	Comments
271.0@	3769.47	<0.04			$\sigma(n,\gamma)<0.05 \text{ mb}$ (92Ra19).
289.2@	3787.70	<0.04			$\sigma(n,\gamma)<0.05 \text{ mb}$ (92Ra19).
*295.7 4		0.034 9			$\sigma(n,\gamma)=0.04 \text{ mb}$ 1 (92Ra19).
*326.0 4		0.084 17			$\sigma(n,\gamma)=0.10 \text{ mb}$ 2 (92Ra19).
333.3 3	(10609.18)	0.11 3			$\sigma(n,\gamma)=0.13 \text{ mb}$ 3 (92Ra19).
*355.80 8		0.29 3			$\sigma(n,\gamma)=0.34 \text{ mb}$ 3 (92Ra19).
400.9 4	5231.55	0.050 17	(M1)		$\sigma(n,\gamma)=0.06 \text{ mb}$ 2 (92Ra19).
407.14 7	(10609.18)	0.31 3			$\sigma(n,\gamma)=0.37 \text{ mb}$ 3 (92Ra19).
421.0 5	5231.55	0.059 17			$\sigma(n,\gamma)=0.07 \text{ mb}$ 2 (92Ra19).
*646.8 3		0.101 17			$\sigma(n,\gamma)=0.12 \text{ mb}$ 2 (92Ra19).
*692.5 5		0.084 17			$\sigma(n,\gamma)=0.10 \text{ mb}$ 2 (92Ra19).
(782.0)	5614.01	0.029 10	M1+E2	+0.20 11	$\sigma(n,\gamma)=0.035 \text{ mb}$ 12.
(803.6)	5614.01	0.010 5			$\sigma(n,\gamma)=0.012 \text{ mb}$ 6.
816.87 5	(10609.18)	1.09 5			$\sigma(n,\gamma)=1.30 \text{ mb}$ 6 (92Ra19).
989.45 5	(10609.18)	1.06 5			$\sigma(n,\gamma)=1.26 \text{ mb}$ 6 (92Ra19).
998.9 3	9103.72	0.25 3			$\sigma(n,\gamma)=0.30 \text{ mb}$ 3 (92Ra19).
1012.05 9	(10609.18)	0.82 5			$\sigma(n,\gamma)=0.98 \text{ mb}$ 5 (92Ra19).
1022.6@	4810.34	<0.03			$\sigma(n,\gamma)<0.04 \text{ mb}$ (92Ra19).
1027.1@	6641.19	<0.03			$\sigma(n,\gamma)<0.04 \text{ mb}$ (92Ra19).
1040.9@	4810.34	<0.03			$\sigma(n,\gamma)<0.04 \text{ mb}$ (92Ra19).
1061.3@	4830.84	<0.03			$\sigma(n,\gamma)<0.04 \text{ mb}$ (92Ra19).
1153.61 13	6641.19	0.45 4	(M1)		$\sigma(n,\gamma)=0.54 \text{ mb}$ 4 (92Ra19).
(1248.0)	8163.18	0.13 6			$\sigma(n,\gamma)=0.15 \text{ mb}$ 7.
1263.18 6	3498.51	5.51 17	M1+E2	+0.18 4	$\sigma(n,\gamma)=6.56 \text{ mb}$ 20 (92Ra19).
1301.12 5	(10609.18)	1.52 5			$\sigma(n,\gamma)=1.81 \text{ mb}$ 6 (92Ra19).
1311.80 14	4810.34	0.40 4	M1+E2	-0.17 5	$\sigma(n,\gamma)=0.48 \text{ mb}$ 4 (92Ra19).
1332.48 16	4830.84	0.29 4	M1+E2	+0.7 5	$\sigma(n,\gamma)=0.34 \text{ mb}$ 4 (92Ra19).
1390.3 5	8898.07	0.059 17			$\sigma(n,\gamma)=0.07 \text{ mb}$ 2 (92Ra19).
1409.6@	6641.19	<0.03			$\sigma(n,\gamma)<0.04 \text{ mb}$ (92Ra19).
1462.0	5231.55	<0.03			$\sigma(n,\gamma)<0.04 \text{ mb}$ (92Ra19).
*1469.2 4		0.14 3			$\sigma(n,\gamma)=0.17 \text{ mb}$ 3 (92Ra19).
1505.46 4	(10609.18)	3.79 12			$\sigma(n,\gamma)=4.51 \text{ mb}$ 14 (92Ra19).
1534.12 4	3769.47	5.52 17	M1+E2	-0.09 3	$\sigma(n,\gamma)=6.57 \text{ mb}$ 20 (92Ra19).
1552.36 4	3787.70	3.61 11	E2		$\sigma(n,\gamma)=4.30 \text{ mb}$ 13 (92Ra19).
1602.8 9	5372.2	0.08 3	M1		$\sigma(n,\gamma)=0.10 \text{ mb}$ 3 (92Ra19).
1655.89 12	(10609.18)	0.70 5			$\sigma(n,\gamma)=0.83 \text{ mb}$ 5 (92Ra19).
1672.7 3	(10609.18)	0.27 3			$\sigma(n,\gamma)=0.32 \text{ mb}$ 3 (92Ra19).
1711.3 3	(10609.18)	4.2 9			$\sigma(n,\gamma)=5.0 \text{ mb}$ 10 (92Ra19).
1733.00 10	5231.55	1.11 5	M1+E2	+0.12 6	$\sigma(n,\gamma)=1.32 \text{ mb}$ 6 (92Ra19).

Continued on next page (footnotes at end of table)

$^{29}\text{Si}(\text{n},\gamma)$ E=thermal 92Ra19,90Is02 (continued) **$\gamma(^{30}\text{Si})$ (continued)**

E γ	E(level)	I $\gamma^{\dagger\#}$	Mult. ‡	δ^{\ddagger}	Comments
1810.42 22	6641.19	0.45 4	(E1)		$\sigma(n,\gamma)=0.54 \text{ mb } 4$ (92Ra19).
1830.6 4	6641.19	0.23 4	(E1)		$\sigma(n,\gamma)=0.27 \text{ mb } 4$ (92Ra19).
1844.40 16	5614.01	0.52 5	M1+E2	+0.11 5	$\sigma(n,\gamma)=0.62 \text{ mb } 5$ (92Ra19).
1893.6 5	7507.86	0.16 4			$\sigma(n,\gamma)=0.19 \text{ mb } 4$ (92Ra19).
1933.9 5	6744.06	0.18 4			$\sigma(n,\gamma)=0.22 \text{ mb } 4$ (92Ra19).
1989.02 7	5487.55	1.06 5	E1 (+M2)	-0.02 7	$\sigma(n,\gamma)=1.26 \text{ mb } 6$ (92Ra19).
2020.33 23	7507.86	1.27 5			$\sigma(n,\gamma)=1.51 \text{ mb } 6$ (92Ra19).
2154.3 6	8898.07	0.12 3			$\sigma(n,\gamma)=0.14 \text{ mb } 3$ (92Ra19).
2235.23 3	2235.308	45.6 14	E2		I γ : 62.4 15 (90Is02). $\sigma(n,\gamma)=54.3 \text{ mb } 16$ (92Ra19).
2256.7 4	8898.07	0.21 4			$\sigma(n,\gamma)=0.25 \text{ mb } 4$ (92Ra19).
2276.22 8	7507.86	1.24 6			$\sigma(n,\gamma)=1.48 \text{ mb } 7$ (92Ra19).
2359.57 4	9103.72	3.52 11			I γ : 6.3 12 (90Is02). $\sigma(n,\gamma)=4.19 \text{ mb } 13$ (92Ra19).
2445.94 3	(10609.18)	7.9 3	E1 $^{\$}$		I γ : 10.5 8 (90Is02). $\sigma(n,\gamma)=9.4 \text{ mb } 3$ (92Ra19).
2454.5 3	(10609.18)	0.25 3			$\sigma(n,\gamma)=0.30 \text{ mb } 3$ (92Ra19).
2504.3 $^{\circ}$	(10609.18)	<0.03			$\sigma(n,\gamma)<0.04 \text{ mb}$ (92Ra19).
2574.8 5	4810.34	0.13 4	M1+E2	-0.52 11	$\sigma(n,\gamma)=0.15 \text{ mb } 4$ (92Ra19).
2595.39 4	4830.84	2.81 9	M1+E2	+0.73 9	I γ : 1.9 6 (90Is02). $\sigma(n,\gamma)=3.35 \text{ mb } 10$ (92Ra19).
(2667)	8154.8	0.050 17			$\sigma(n,\gamma)=0.06 \text{ mb } 2$.
2667.0 6	9308.07	0.13 4			$\sigma(n,\gamma)=0.16 \text{ mb } 4$ (92Ra19).
2676.87 6	7507.86	2.18 10	(E1)		I γ : 2.6 7 (90Is02). $\sigma(n,\gamma)=2.59 \text{ mb } 11$ (92Ra19).
*2747.6 5		0.11 3			$\sigma(n,\gamma)=0.13 \text{ mb } 3$ (92Ra19).
2871.6 3	6641.19	0.34 5	(E1)		$\sigma(n,\gamma)=0.40 \text{ mb } 5$ (92Ra19).
2941.9 5	(10609.18)	0.18 3			$\sigma(n,\gamma)=0.22 \text{ mb } 3$ (92Ra19).
2956.25 12	6744.06	1.09 6			$\sigma(n,\gamma)=1.30 \text{ mb } 7$ (92Ra19).
2996.2 9	5231.55	0.12 3			$\sigma(n,\gamma)=0.14 \text{ mb } 3$ (92Ra19).
3101.19 3	(10609.18)	23.7 8	E1 $^{\$}$		I γ : 29.2 7 (90Is02). $\sigma(n,\gamma)=28.2 \text{ mb } 9$ (92Ra19).
3136.6 7	5372.2	0.13 4	E2		$\sigma(n,\gamma)=0.15 \text{ mb } 4$ (92Ra19).
3142.5 $^{\circ}$	6641.19	<0.06			$\sigma(n,\gamma)<0.07 \text{ mb}$ (92Ra19).
3145.1 $^{\circ}$	6914.78	<0.05			$\sigma(n,\gamma)<0.06 \text{ mb}$ (92Ra19).
3252.00 9	5487.55	1.10 5	E1 (+M2)	-0.04 5	I γ : 1.3 5 (90Is02). $\sigma(n,\gamma)=1.31 \text{ mb } 6$ (92Ra19).
3283.8 3	8898.07	0.36 5			$\sigma(n,\gamma)=0.43 \text{ mb } 5$ (92Ra19).
3294.9 9	8104.8	0.050 17			$\sigma(n,\gamma)=0.06 \text{ mb } 2$ (92Ra19).
3378.68 25	5614.01	0.38 5	M1+E2	-0.29 4	$\sigma(n,\gamma)=0.45 \text{ mb } 5$ (92Ra19).
3415.7 7	6914.78	0.13 4			$\sigma(n,\gamma)=0.16 \text{ mb } 4$ (92Ra19).
3498.33 5	3498.51	5.42 17	E2		I γ : 7.6 5 (90Is02). $\sigma(n,\gamma)=6.45 \text{ mb } 20$ (92Ra19).
3693.8 $^{\circ}$	9308.07	<0.08			$\sigma(n,\gamma)<0.10 \text{ mb}$ (92Ra19).
3694.2 3	(10609.18)	1.10 6			$\sigma(n,\gamma)=1.31 \text{ mb } 7$ (92Ra19).
3738.20 18	7507.86	1.71 9	(E1)		I γ : 2.1 2 (90Is02). $\sigma(n,\gamma)=2.04 \text{ mb } 10$ (92Ra19).
3769.22 5	3769.47	4.70 15	M1		I γ : 5.9 3 (90Is02). $\sigma(n,\gamma)=5.59 \text{ mb } 17$ (92Ra19).
(3787.6)	3787.70	0.0101 17	E0		I γ : 35.6 5 (90Is02).
3864.89 3	(10609.18)	29.8 10	E1 $^{\$}$		$\sigma(n,\gamma)=35.5 \text{ mb } 11$ (92Ra19).
3967.78 9	(10609.18)	3.95 13			I γ : 5.2 3 (90Is02). $\sigma(n,\gamma)=4.70 \text{ mb } 15$ (92Ra19).
4009.09 21	7507.86	0.93 5	(E1)		I γ : 0.8 3 (90Is02). $\sigma(n,\gamma)=1.11 \text{ mb } 5$ (92Ra19).
4087.6 5	8898.07	0.34 4			$\sigma(n,\gamma)=0.40 \text{ mb } 4$ (92Ra19).
4168.4 $^{\circ}$	7667.2	<0.05			$\sigma(n,\gamma)<0.06 \text{ mb}$ (92Ra19).
4375.18 15	8163.18	1.22 5			$\sigma(n,\gamma)=1.45 \text{ mb } 6$ (92Ra19).
4393.43 23	8163.18	0.71 5			$\sigma(n,\gamma)=0.84 \text{ mb } 5$ (92Ra19).
4405.56 8	6641.19	2.91 10			I γ : 4.4 3 (90Is02). $\sigma(n,\gamma)=3.46 \text{ mb } 11$ (92Ra19).

Continued on next page (footnotes at end of table)

$^{29}\text{Si}(\text{n},\gamma)$ E=thermal 92Ra19,90Is02 (continued) **$\gamma(^{30}\text{Si})$ (continued)**

E γ	E(level)	I $\gamma^{\dagger\#}$	Mult. ‡	δ^{\ddagger}	Comments
4508.64 17	6744.06	0.66 5	(E1)		I γ : 1.7 3 (90Is02). $\sigma(n,\gamma)=0.79$ mb 5 (92Ra19).
(4656)	8154.8	0.059 17			$\sigma(n,\gamma)=0.07$ mb 2.
4664.36 12	8163.18	1.13 5			I γ : 0.8 2 (90Is02).
4679.2 3	6914.78	0.43 4	M1+E2	-0.63 14	$\sigma(n,\gamma)=1.35$ mb 5 (92Ra19).
4766.7 7	9597.17	0.10 3			$\sigma(n,\gamma)=0.51$ mb 4 (92Ra19).
4786.5 8	9597.17	0.08 3			$\sigma(n,\gamma)=0.12$ mb 3 (92Ra19).
4810.0 3	4810.34	0.45 4	E2		$\sigma(n,\gamma)=0.10$ mb 3 (92Ra19).
4994.9 7	(10609.18)	0.27 5			I γ : 1.2 4 (90Is02).
5128.18 17	8898.07	1.64 7			$\sigma(n,\gamma)=0.54$ mb 4 (92Ra19).
5272.09 7	7507.86	15.8 5	(E1)		$\sigma(n,\gamma)=0.32$ mb 5 (92Ra19).
5398.8 4	8898.07	0.40 5			I γ : 1.9 1 (90Is02).
5431.5 6	7667.2	0.17 4			$\sigma(n,\gamma)=1.95$ mb 8 (92Ra19).
5538.05 24	9308.07	0.80 5			I γ : 19.8 3 (90Is02).
5868.8 7	8104.8	0.18 4			$\sigma(n,\gamma)=18.8$ mb 6 (92Ra19).
5920.2 7	8154.8	0.13 4			$\sigma(n,\gamma)=0.48$ mb 6 (92Ra19).
5927.24 15	8163.18	1.34 7			$\sigma(n,\gamma)=0.20$ mb 4 (92Ra19).
6004.4 9	9792.34	0.07 3			I γ : 1.1 1 (90Is02).
6098.0 3	9597.17	0.53 5			$\sigma(n,\gamma)=0.95$ mb 6 (92Ra19).
(6431.7)	10202.08	0.14 4	(E1)		$\sigma(n,\gamma)=0.63$ mb 6 (92Ra19).
6487.0 7	10275.8	0.10 3			$\sigma(n,\gamma)=0.17$ mb 4 (92Ra19).
6640.7 9	6641.19	0.14 5	M2 $^{\$}$		I γ : 1.2 1 (90Is02).
6662.00 25	8898.07	1.04 5			$\sigma(n,\gamma)=0.16$ mb 4 (92Ra19).
6717.3 8	8953.29	0.24 5			I γ : 1.4 1 (90Is02).
6743.22 4	6744.06	30.7 10	E1		$\sigma(n,\gamma)=1.60$ mb 8 (92Ra19).
6820.7 4	(10609.18)	1.08 8			$\sigma(n,\gamma)=0.08$ mb 3 (92Ra19).
6838.83 15	(10609.18)	3.68 14			I γ : 4.2 2 (90Is02).
6913.7 5	6914.78	0.34 5	E2		$\sigma(n,\gamma)=1.24$ mb 6 (92Ra19).
7071.8 7	9308.07	0.15 4			$\sigma(n,\gamma)=0.29$ mb 5 (92Ra19).
7109.82 7	(10609.18)	5.02 16			I γ : 37.0 4 (90Is02).
7507.4 8	7507.86	0.14 4			$\sigma(n,\gamma)=36.6$ mb 11 (92Ra19).
(7666)	7667.2	0.020 7			I γ : 0.9 1 (90Is02).
x7944.5 9		0.059 17			$\sigma(n,\gamma)=1.28$ mb 9 (92Ra19).
7965.8 9	10202.08	0.059 17			I γ : 4.2 2 (90Is02).
8162.01 11	8163.18	2.93 10			$\sigma(n,\gamma)=4.38$ mb 16 (92Ra19).
8372.7 3	(10609.18)	0.66 5			$\sigma(n,\gamma)=0.18$ mb 4 (92Ra19).
8896.7 3	8898.07	0.50 5			I γ : 5.7 2 (90Is02).
8951.9 5	8953.29	0.27 4			$\sigma(n,\gamma)=5.98$ mb 18 (92Ra19).
9618.20 25	9619.76	1.02 5	E1		$\sigma(n,\gamma)=0.17$ mb 4 (92Ra19).
9790.5 3	9792.34	0.93 5	E1		$\sigma(n,\gamma)=0.024$ mb 8.
10200.6 6	10202.08	0.24 3	E1		I γ : 0.07 mb 2 (92Ra19).
10607.1644 5	(10609.18)	6.73 21	M1 $^{\$}$		I γ : 1.2 1 (90Is02).
					$\sigma(n,\gamma)=0.07$ mb 2 (92Ra19).
					I γ : 3.4 2 (90Is02).
					$\sigma(n,\gamma)=0.11$ mb 6 (92Ra19).
					I γ : 0.3 1 (90Is02).
					$\sigma(n,\gamma)=0.28$ mb 3 (92Ra19).
					E γ : from 97Ro26.
					I γ : 7.7 2 (90Is02).
					$\sigma(n,\gamma)=8.01$ mb 25 (92Ra19).

Footnotes continued on next page

²⁹Si(n, γ) E=thermal 92Ra19,90Is02 (continued)

$\gamma(^{30}\text{Si})$ (continued)

[†] Absolute intensities per 100 neutron captures. For γ -ray cross section in mb (92Ra19), multiply by 1.1905 per 100 neutron captures.

‡ From adopted gammas, except as noted.

§ From 92Ra19.

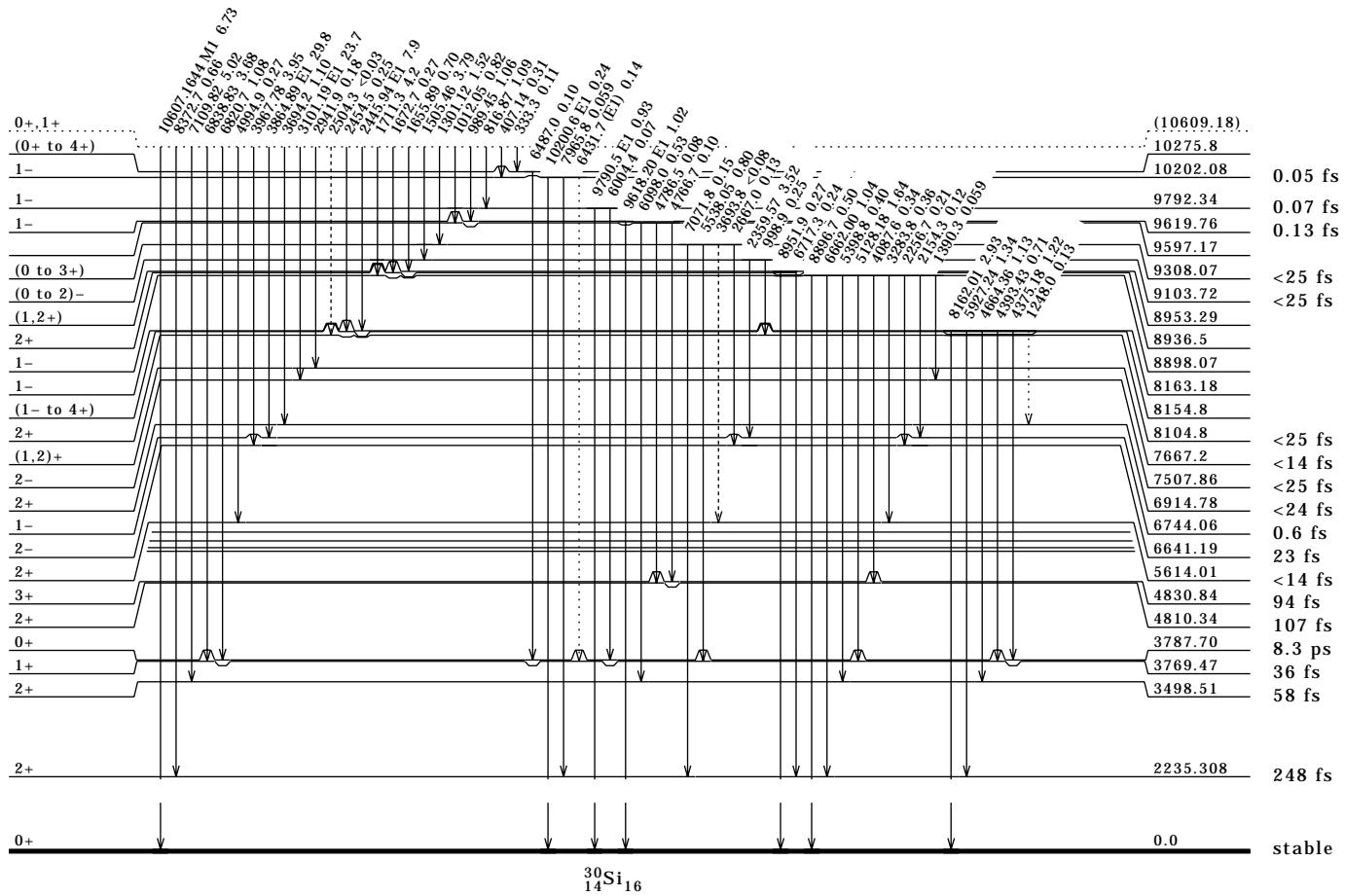
For intensity per 100 neutron captures, multiply by 1.

^a Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

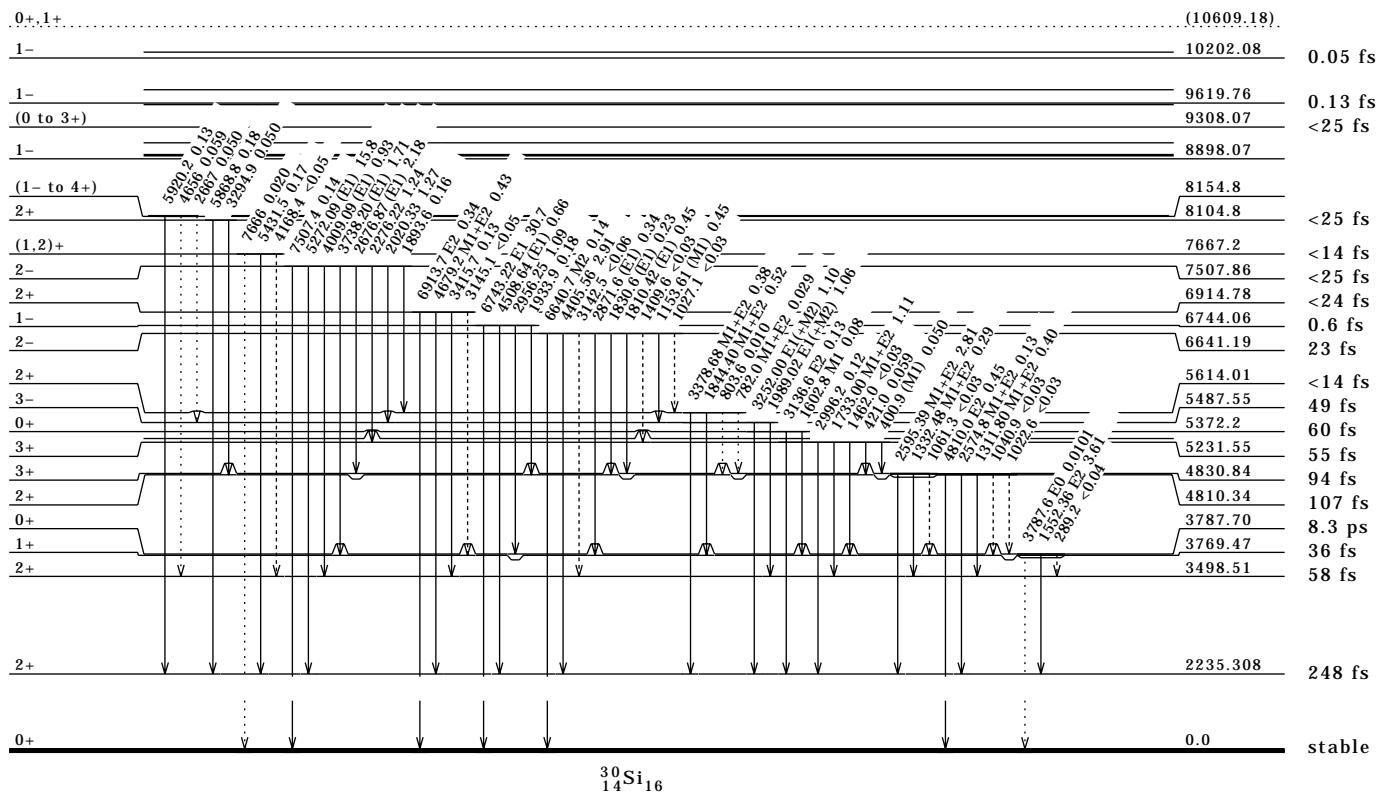
Level Scheme

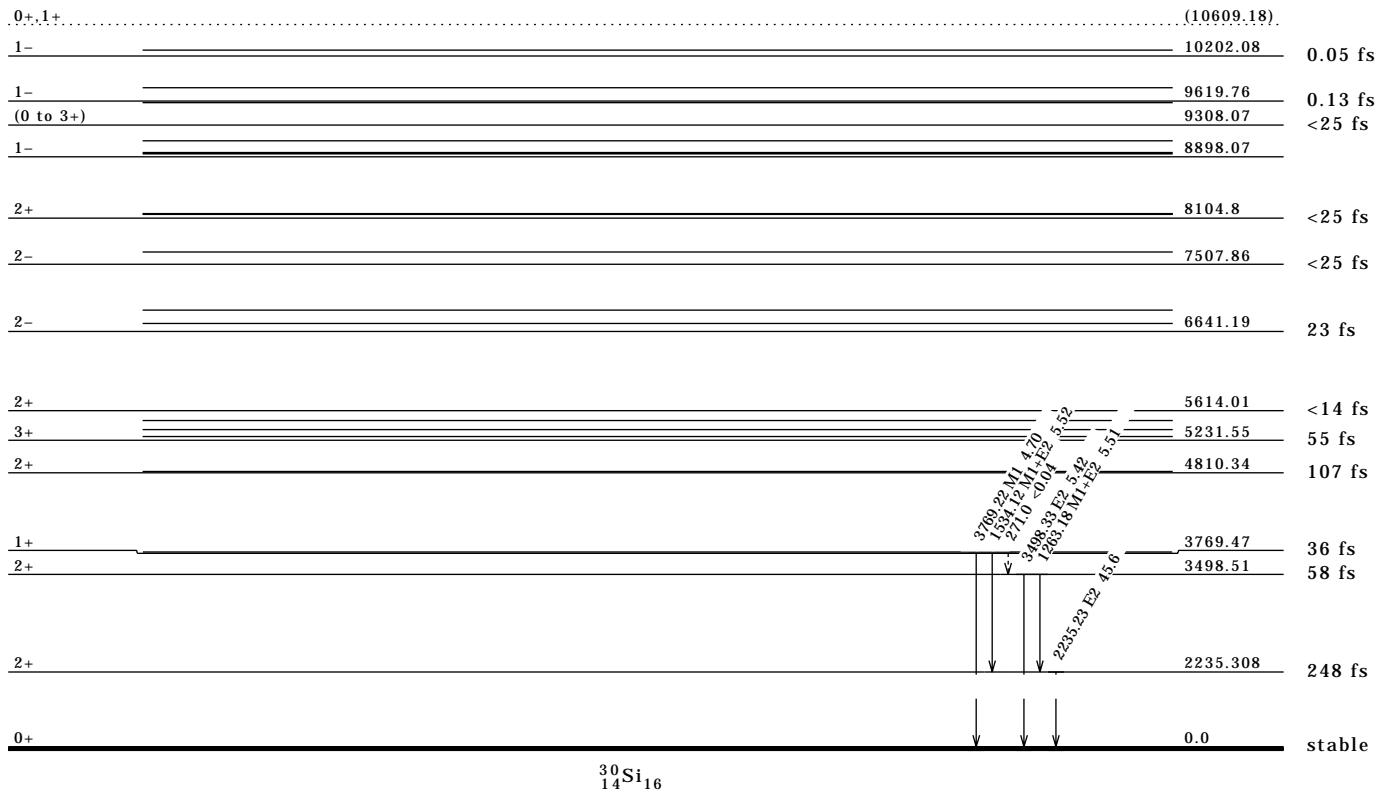
Intensities: $I(\gamma + ce)$ per 100 parent decays



$^{29}\text{Si}(n,\gamma)$ E=thermal 92Ra19,90Is02 (continued)

Level Scheme (continued)

Intensities: I($\gamma+ce$) per 100 parent decays

$^{29}\text{Si}(n,\gamma)$ E=thermal 92Ra19,90Is02 (continued)Level Scheme (continued)Intensities: $I(\gamma+ce)$ per 100 parent decays **$^{30}\text{Si}(n,\gamma)$ E=thermal 92Ra19,90Is02**

Others: 90Is02, 90Is05.

Target $J\pi=0^+$.92Ra19: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl) in Compton-suppressed mode and pair spectrometer mode. Deduced neutron separation energy $S(n)=6587.40$ keV 5.Other measured $S(n)=6587.32$ keV 20 (90Is02).Evaluated $S(n)=6587.40$ keV 5 (95Au04).Measured thermal-neutron capture cross section, $\sigma(n,\gamma)=107$ mb 3 (92Ra19), 107 mb 2 (90Is02, 90Is05). ^{31}Si Levels

$E(\text{level})^\ddagger$	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0 . 0	3 / 2 +	157 . 3 min 3	
752 . 23 3	1 / 2 +	530 fs 100	
1694 . 92 4	5 / 2 +	570 fs 110	
2316 . 94 10	3 / 2 +	38 ps 18	

Continued on next page (footnotes at end of table)

$^{30}\text{Si}(\text{n},\gamma)$ E=thermal 92Ra19,90Is02 (continued) **^{31}Si Levels (continued)**

E(level) [‡]	Jπ [†]	T _{1/2} [†]	Comments
2788.03 6	5/2+, (3/2)+	<30 fs	
3532.92 3	3/2-	<10 fs	
4382.37 4	3/2-		
5281.36 4	1/2+		
5873.15 7	(1/2, 3/2)-		
5957.92 19			
(6587.40 5)	1/2+		E(level): from evaluated S(n) (95Au04). Jπ: from s-wave neutron capture. Observed deexcitation intensity is 101% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From Eγ's using least-squares fit to data, except as noted. **$\gamma(^{31}\text{Si})$**

All data are from 92Ra19, except as noted.

Iγ normalization: renormalized from assuming Iγ(to g.s.)=100.

Eγ	E(level)	Iγ ^{†#}	Mult. [‡]	δ [‡]	Comments
622.19 20	2316.94	0.12 3	(M1)		$\sigma(n,\gamma)=0.13 \text{ mb}$ 3 (92Ra19).
629.43 19	(6587.40)	0.20 3			$\sigma(n,\gamma)=0.21 \text{ mb}$ 3 (92Ra19).
714.22 6	(6587.40)	0.87 6			$\sigma(n,\gamma)=0.93 \text{ mb}$ 6 (92Ra19).
745.1 9	3532.92	0.028 10			$\sigma(n,\gamma)=0.03 \text{ mb}$ 1 (92Ra19).
752.22 3	752.23	88 3	(M1)		$\sigma(n,\gamma)=94.4 \text{ mb}$ 30 (92Ra19).
849.45 15	4382.37	0.41 5			$\sigma(n,\gamma)=0.44 \text{ mb}$ 5 (92Ra19).
898.6 7	5281.36	0.065 19			$\sigma(n,\gamma)=0.07 \text{ mb}$ 2 (92Ra19).
943.2 7	1694.92	0.037 10			$\sigma(n,\gamma)=0.04 \text{ mb}$ 1 (92Ra19).
1216.0 [@]	3532.92	<0.047			$\sigma(n,\gamma)<0.05 \text{ mb}$ (92Ra19).
1305.99 4	(6587.40)	17.0 6	M1 ^{\$}		$\sigma(n,\gamma)=18.2 \text{ mb}$ 6 (92Ra19).
1564.2 4	2316.94	0.15 4			$\sigma(n,\gamma)=0.16 \text{ mb}$ 4 (92Ra19).
1594.30 6	4382.37	0.96 6			$\sigma(n,\gamma)=1.03 \text{ mb}$ 6 (92Ra19).
1694.87 5	1694.92	3.70 19	M1+E2	+4.4 7	$\sigma(n,\gamma)=3.96 \text{ mb}$ 20 (92Ra19).
1748.38 6	5281.36	1.28 7			$\sigma(n,\gamma)=1.37 \text{ mb}$ 7 (92Ra19).
1837.92 5	3532.92	2.05 12			$\sigma(n,\gamma)=2.19 \text{ mb}$ 12 (92Ra19).
(2036.2)	2788.03	0.056 19			$\sigma(n,\gamma)=0.06 \text{ mb}$ 2.
2065.6 6	4382.37	0.11 3			$\sigma(n,\gamma)=0.12 \text{ mb}$ 3 (92Ra19).
2204.95 3	(6587.40)	12.7 5	E1 ^{\$}		Iγ: 13.0 19 (90Is02). $\sigma(n,\gamma)=13.6 \text{ mb}$ 5 (92Ra19).
2316.80 14	2316.94	0.67 6			$\sigma(n,\gamma)=0.72 \text{ mb}$ 6 (92Ra19).
2493.2 [@]	5281.36	<0.075			$\sigma(n,\gamma)<0.08 \text{ mb}$ (92Ra19).
2687.35 8	4382.37	1.54 10			$\sigma(n,\gamma)=1.65 \text{ mb}$ 10 (92Ra19).
2780.56 3	3532.92	67.0 23	(E1)		Iγ: 69.6 14 (90Is02). $\sigma(n,\gamma)=71.7 \text{ mb}$ 24 (92Ra19).
2787.90 12	2788.03	1.08 9			$\sigma(n,\gamma)=1.16 \text{ mb}$ 9 (92Ra19).
2964.26 18	5281.36	0.67 7			$\sigma(n,\gamma)=0.72 \text{ mb}$ 7 (92Ra19).
3054.33 3	(6587.40)	68.1 22	E1 ^{\$}		Iγ: 71.3 12 (90Is02). $\sigma(n,\gamma)=72.8 \text{ mb}$ 23 (92Ra19).
3532.74 8	3532.92	1.66 10	(E1)		$\sigma(n,\gamma)=1.78 \text{ mb}$ 10 (92Ra19).
3586.2 [@]	5281.36	<0.093			$\sigma(n,\gamma)<0.10 \text{ mb}$ (92Ra19).
3629.90 4	4382.37	7.6 3			Iγ: 7.5 7 (90Is02). $\sigma(n,\gamma)=8.1 \text{ mb}$ 3 (92Ra19).
3640.2 9	5957.92	0.037 19			$\sigma(n,\gamma)=0.04 \text{ mb}$ 2 (92Ra19).
3798.2 8	(6587.40)	0.13 4			$\sigma(n,\gamma)=0.14 \text{ mb}$ 4 (92Ra19).
4270.1 [@]	(6587.40)	<0.065			$\sigma(n,\gamma)<0.07 \text{ mb}$ (92Ra19).
4382.04 14	4382.37	1.73 13			$\sigma(n,\gamma)=1.85 \text{ mb}$ 14 (92Ra19).
4528.77 4	5281.36	14.7 5	M1		Iγ: 14.3 5 (90Is02). $\sigma(n,\gamma)=15.7 \text{ mb}$ 5 (92Ra19).
4892.1 [@]	(6587.40)	<0.093			$\sigma(n,\gamma)<0.10 \text{ mb}$ (92Ra19).
5280.9 6	5281.36	0.22 4			$\sigma(n,\gamma)=0.24 \text{ mb}$ 4 (92Ra19).
5834.2 6	(6587.40)	0.23 4			$\sigma(n,\gamma)=0.25 \text{ mb}$ 4 (92Ra19).
5872.37 18	5873.15	0.81 9			Iγ: 0.9 3 (90Is02). $\sigma(n,\gamma)=0.87 \text{ mb}$ 9 (92Ra19).

Continued on next page (footnotes at end of table)

$^{30}\text{Si}(\text{n},\gamma)$ E=thermal 92Ra19,90Is02 (continued) **$\gamma(^{31}\text{Si})$ (continued)**

E γ	E(level)	I $\gamma^{\dagger \#}$	Comments
5956.9 8	5957.92	0.11 3	$\sigma(n,\gamma)=0.12 \text{ mb}$ 3 (92Ra19).
6586.6457 5	(6587.40)	1.47 13	I γ : 1.5 2 (90Is02). $\sigma(n,\gamma)=1.57 \text{ mb}$ 14 (92Ra19).

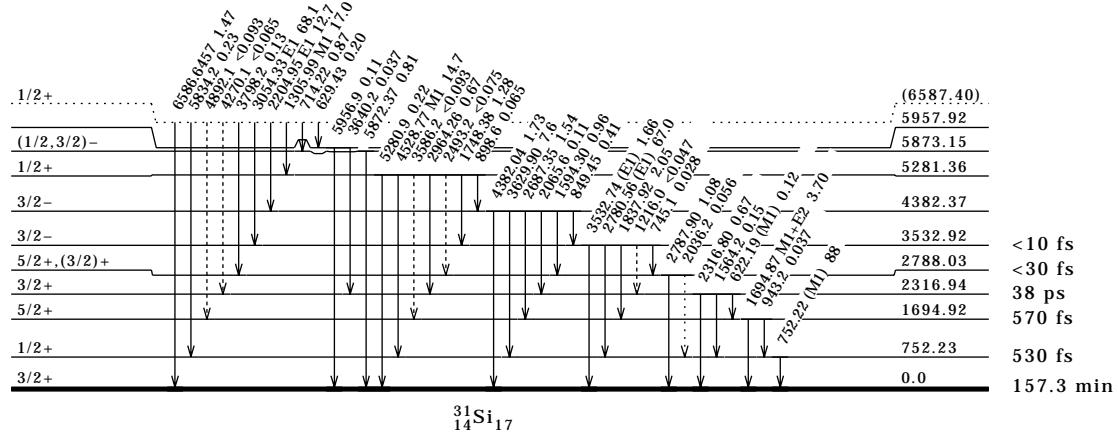
\dagger Absolute intensities per 100 neutron captures. For γ -ray cross section in mb (92Ra19), multiply by 1.0707 per 100 neutron captures.

\ddagger From adopted gammas, except as noted.

\S From 92Ra19.

$\#$ For intensity per 100 neutron captures, multiply by 1.

\circledast Placement of transition in the level scheme is uncertain.

Level SchemeIntensities: I($\gamma+ce$) per 100 parent decays

$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11Target $J\pi=1/2^+$.89Mi16: measured $E\gamma$, $I\gamma$ with a HpGe detector and a pair spectrometer. Deduced neutron separation energy $S(n)=7935.74$ keV 16.89Ze02: measured $E\gamma$, $I\gamma$ with a Ge(Li) and a HpGe detector. Deduced neutron separation energy $S(n)=7936.65$ keV 8.Other measured $S(n)=7935.70$ keV 4 (85Ke11).Evaluated $S(n)=7935.65$ keV 4 (95Au04).Measured thermal-neutron capture cross section, $\sigma(n,\gamma)=173$ mb 6 (89Ze02). **^{32}P Levels**

E(level) [†]	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0.0	1+	14.262 d 14	% β^- =100.
78.060 18	2+	278 ps 12	
512.703 20	0+	1.83 ps 6	
1149.384 20	1+	175 fs 6	
1322.830 25	2+	324 fs 12	
1755.01 4	3+	460 fs 35	
2177.28 5	3+	43 fs 8	
2217.75 6	2+	150 fs 25	
2229.73 3	1+	25 fs 14	
2313.45# 8	(1+ to 3+)		
2579.12# 14	(0 to 2)		
2657.64 5	2+	<7 fs	
2740.46 5	1+	50 fs 30	
3073.90?§# 13	(1+ to 3+)		
3263.998 23	2-	90 fs 20	
3444.37 4	(1, 2+)	25 fs 10	
3791.40# 12	1+	50 fs 30	
4009.00 5	2-		
4035.57 3	1-		
4549.29# 13	1+		
4661.53 4	2-		
4710.58 17	1+		
4877.45 4	1-		
5072.53 8	0+		
5307.58?§# 11	(1, 2)+		
5325.99?§# 14			
5349.65 4	2-		
5509.41 5	1-		
5696.22?@ 6			
5701.49 7	(1, 2)-		
5778.73 3	1-		
6062.14 5	1-		
6196.36 5	1-		
6332.54# 19	(0, 1)+		
6510.36§# 24			
6557.99?§# 12	(0+ to 3+)		
6581.89 6	(0+ to 3+)		
6783.69# 15	(0+ to 3+)		
(7935.65 4)	0+, 1+		

E(level): from evaluated $S(n)$ (95Au04). $J\pi$: from s-wave neutron capture.

Observed deexcitation intensity is 93% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From $E\gamma$'s using least-squares fit to data, except as noted.[§] Not seen in 85Ke11.[#] Not seen in 89Ze02.[@] Seen in 89Ze02 and 85Ke11.

$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11 (continued) $\gamma(^{32}\text{P})$

All data are from 89Mi16, except as noted. Errors include systematic errors of 25% for $0.4 < E_\gamma \leq 2$ MeV; 15% for $2 < E_\gamma \leq 3$ MeV; 5% for $E_\gamma > 3$ MeV.

I_γ normalization: renormalized from assuming $I(\gamma+ce)(\text{to g.s.})=100$.

E_γ^\dagger	$E(\text{level})$	$I_\gamma^\$$	Mult. ‡	δ^\ddagger	Comments
78.099 25	78.060	36.69 25	(M1)		
(432.15 11)	1755.01	0.061 3	M1+E2	-0.12 10	I_γ : from intensity balance. $\alpha=0.00938$.
(434.63 4)	512.703	0.061 3			Not observed.
(512.69 3)	512.703	50 CA	M1		Obscured by the 511-keV annihilation line. I_γ : from intensity balance. 37.9 8 (89Ze02).
558.51 8	2313.45	0.62 15			
636.670 28	1149.384	21.2 53	M1		I_γ : 7.40 2 (89Ze02).
x724.25 28		0.119 30			
745.04 5	4009.00	0.80 20			
754.52 10	6062.14	0.37 9			
771.51 12	4035.57	0.29 7			
x837.0 5		0.088 22			
895.10 13	2217.75	0.28 7	M1 (+E2)	0.0 3	
902.65 18	2657.64	0.189 47	(M1)		
907.07 25	2229.73	0.135 34	(M1)		
1034.316 41	3263.998	1.43 36	(E1)		
(1068.38 12)	2217.75	0.10 3			
1071.270 33	1149.384	16.9 42	M1+E2	+0.14 7	
1149.331 42	1149.384	2.5 6			I_γ : 1.67 2 (89Ze02).
1152.12# 18	5701.49	0.24# 6			
	(7935.65)	0.24# 6			
x1198.98 9		0.51 13			
1208.92 29	6557.99?	0.154 39			
x1211.39 33		0.135 34			
1214.56 9	3444.37	0.51 13			I_γ : 0.30 3 (89Ze02).
1217.65 39	4661.53	0.100 25			
x1222.31 25		0.148 37			
1229.44 19	5778.73	0.197 49			I_γ : 1.72 2 (89Ze02).
1244.764 39	1322.830	2.4 6			
1256.24# 19	2579.12	0.197# 49			
	(7935.65)	0.197# 49			
x1265.73 11		0.70 17			
x1269.79 16		0.39 10			
x1272.97 16		0.26 6			
1314.35 19	5349.65	0.21 5			
1318.94# 21	3073.90?	0.192# 48			
	6196.36	0.192# 48			
1322.850 38	1322.830	3.8 9			I_γ : 3.83 4 (89Ze02).
1340.64 20	5349.65	0.37 9			I_γ : 0.55 2 (89Ze02).
1353.83 6	(7935.65)	0.84 21			I_γ : 0.56 5 (89Ze02).
1377.83# 12	4035.57	0.37# 9			
	(7935.65)	0.37# 9			
x1401.76 21		0.20 5			
1425.33 24	(7935.65)	0.172 43			
1429.89# 37	2579.12	0.125# 31			
	4009.00	0.125# 31			
1432.66 34	4877.45	0.137 34			
1473.72 10	5509.41	0.44 11			
1509.017 44	3263.998	2.3 6	(E1)		I_γ : 1.80 3 (89Ze02).
1587.36 19	4661.53	0.32 8			
1613.74# 12	3791.40	0.35# 9			
	4877.45	0.35# 9			
1676.992 45	1755.01	2.9 7	M1+E2	-0.79 8	I_γ : 2.38 1 (89Ze02).
1739.40 5	(7935.65)	1.48 37			I_γ : 1.07 9 (89Ze02), 1.37 7 (85Ke11).
(1754.94 11)	1755.01	0.064 16	E2 (+M3)	0.0 3	
1800.42@ 25	6510.36	0.160 40			
1805.70 35	4035.57	0.73 18			
1808.49 33	4549.22	0.34 9			
1873.534 49	(7935.65)	2.2 5			I_γ : 1.91 6 (89Ze02), 1.9 1 (85Ke11).
1921.68 29	4661.53	0.143 36			

Continued on next page (footnotes at end of table)

$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11 (continued) **$\gamma(^{32}\text{P})$ (continued)**

E_{γ}^{\dagger}	$E(\text{level})$	$I_{\gamma}^{\$}$	Mult. ‡	δ^{\ddagger}	Comments
1941.160 49	3263.998	3.0 8	E1 (+M2)	-0.1 8	I γ : 2.60 7 (89Ze02), 2.6 1 (85Ke11).
2099.67 12	2177.28	0.324 49	M1+E2	+0.14 3	I γ : 0.36 2 (85Ke11).
2114.483 41	3263.998	8.1 12	E1 (+M2)	+0.01 3	I γ : 7.68 7 (89Ze02), 7.5 4 (85Ke11).
2136.62 24	4877.45	0.259 39			
(2139.65 12)	2217.75	0.14 3			
2151.621 41	2229.73	6.7 10			I γ : 6.3 11 (89Ze02), 7.3 4 (85Ke11).
2156.954 41	(7935.65)	8.5 13			I γ : 8.37 8 (89Ze02), 8.6 4 (85Ke11).
(2177.1 3)	2177.28	0.032 3	E2 (+M3)	-0.09 11	
2217.52 9	2217.75	0.53 8	M1+E2	-0.5 2	I γ : 0.10 5 (89Ze02).
2227.80 9	2740.46	1.61 24	M1		
2229.86 30	2229.73	0.41 6			
2234.12 7	(7935.65)	0.84 13			I γ : 0.44 8 (89Ze02).
x2266.71 21		0.217 33			
2276.34 27	5349.65	0.227 34			
2348.16 17	4661.53	0.281 42			
2426.30 5	(7935.65)	1.90 29			I γ : 1.79 7 (89Ze02), 1.83 9 (85Ke11).
2431.87 15	4661.53	0.33 5			I γ : 0.49 10 (89Ze02), 0.30 2 (85Ke11).
x2445.50 22		0.228 34			
2514.68 6	5778.73	1.19 18			I γ : 0.45 14 (89Ze02), 0.45 2 (85Ke11).
2579.20 35	2657.64	0.68 10			I γ : 5.73 10 (89Ze02), 6.0 3 (85Ke11).
2586.008 48	(7935.65)	6.3 10			I γ : 0.19 1 (85Ke11).
2609.23# 21	5349.65	0.144# 22			
	(7935.65)	0.144# 22			
2657.55 6	2657.64	2.02 30	M1+E2	+0.17 3	I γ : 1.55 18 (89Ze02), 1.79 9 (85Ke11).
2685.99 48	4009.00	0.103 15			I γ : 0.18 3 (89Ze02), 0.19 1 (85Ke11).
x2702.4 5		0.096 14			
2712.76 25	4035.57	0.297 45			I γ : 0.31 2 (85Ke11).
2740.38 11	2740.46	0.52 8			I γ : 0.55 6 (89Ze02), 0.63 6 (85Ke11).
2842.85 28	5072.53	0.170 25	M1		I γ : 0.18 6 (89Ze02).
2863.15 11	(7935.65)	2.05 31			I γ : 2.39 6 (89Ze02), 2.4 1 (85Ke11).
2886.09 6	4035.57	4.1 6			I γ : 4.7 8 (89Ze02), 4.3 2 (85Ke11).
(2931.50 5)	3444.37	0.35 6			
x2933.65 17		0.33 5			
x2953.72 8		0.96 14			
3058.174 47	(7935.65)	6.97 35			I γ : 6.51 11 (89Ze02), 7.2 4 (85Ke11).
3119.86 20	5349.65	0.390 19			I γ : 0.29 5 (89Ze02).
3185.76 6	3263.998	1.99 10	(E1)		I γ : 1.99 6 (89Ze02), 2.1 1 (85Ke11).
3196.9 7	5509.41	0.081 4			
3224.92 19	(7935.65)	0.342 17			I γ : 0.30 6 (89Ze02), 0.32 2 (85Ke11).
x3240.6 5		0.113 6			
3263.41 20	3263.998	0.406 20	E1+M2	-0.10 3	I γ : 0.32 7 (89Ze02), 0.26 1 (85Ke11).
x3267.53 14		0.648 32			
3274.055 45	(7935.65)	5.14 26			I γ : 5.51 13 (89Ze02), 5.4 3 (85Ke11).
3338.84 29	4661.53	0.230 12			I γ : 0.15 1 (85Ke11).
3366.21 10	3444.37	0.683 34			I γ : 0.60 10 (89Ze02), 0.75 4 (85Ke11).
3387.4# 6	4710.58	0.121# 6			
	(7935.65)	0.121# 6			
3444.27 10	3444.37	0.726 36			I γ : 0.77 7 (89Ze02), 0.77 4 (85Ke11).
3482.89# 36	5701.49	0.160# 8			I γ : 0.10 4 (89Ze02), 0.18 1 (85Ke11).
	6062.14	0.160# 8			
x3504.01 47		0.150 7			
3511.58 28	4661.53	0.248 12			I γ : 0.38 5 (89Ze02), 0.45 2 (85Ke11).
3518.75 4	5696.22?				I γ : 0.46 2 (85Ke11).
3522.708 44	4035.57	13.3 7			I γ : 14.57 26 (89Ze02), 14.4 7 (85Ke11).
3548.74 10	5778.73	0.860 43			I γ : 0.69 11 (89Ze02), 0.92 5 (85Ke11).
3554.38 14	4877.45	0.527 26			I γ : 0.34 17 (89Ze02), 0.52 3 (85Ke11).
3560.5# 5	4710.58	0.145# 7			I γ : 0.12 1 (85Ke11).
	5778.73	0.145# 7			
3713.86 44	3791.40	0.174 9	M1+E2	+0.6 5	
x3774.6 5		0.109 5			
3899.946 47	(7935.65)	17.8 9			I γ : 17.34 14 (89Ze02), 19.2 10 (85Ke11).
3922.90 10	5072.53	1.86 9	M1		I γ : 1.69 5 (89Ze02), 1.75 9 (85Ke11).
3926.48 10	(7935.65)	2.24 11			I γ : 2.59 8 (89Ze02), 2.5 1 (85Ke11).

Continued on next page (footnotes at end of table)

$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11 (continued) **$\gamma(^{32}\text{P})$ (continued)**

E_{γ}^{\dagger}	$E(\text{level})$	$I_{\gamma}^{\$}$	Mult. [‡]	δ^{\ddagger}	Comments
3930.19 19	4009.00	0.658 33			I γ : 0.69 4 (89Ze02), 0.70 4 (85Ke11).
3945.9 9	5701.49	0.067 3			
3956.97 11	4035.57	0.633 32			I γ : 0.20 10 (89Ze02), 0.56 3 (85Ke11).
4003.3# 8	5325.99?	0.069# 3			
	6581.89	0.069# 3			
4008.66 9	4009.00	0.742 37			I γ : 1.07 7 (89Ze02), 0.81 4 (85Ke11).
4026.6 10	5349.65	0.049 2			I γ : 0.06 1 (85Ke11).
4035.6# 11	4035.57	0.045# 2			
	4549.22	0.045# 2	M1		
4043.2 8	6783.69	0.064 3			
x4071.92 19		0.279 14			
4125.73 31	6783.69	0.237 12			
4142.75 26	(7935.65)	0.208 10			
4199.92 6	5349.65	3.12 16	E1 (+M2)	+0.04 7	I γ : 3.53 9 (89Ze02), 3.4 2 (85Ke11).
4246.4 18	6557.99?	0.036 2			
x4278.3 7		0.069 3			
4359.83 9	5509.41	1.19 6			I γ : 1.84 10 (89Ze02), 1.09 6 (85Ke11).
4364.45 6	4877.45	4.44 22	E1		I γ : 4.36 12 (89Ze02), 4.7 2 (85Ke11).
x4410.37 15		0.387 19			
4456.26 27	5778.73	0.196 10			I γ : 0.10 4 (89Ze02), 0.21 1 (85Ke11).
x4466.2 9		0.054 3			
4491.07 6	(7935.65)	2.01 10			I γ : 2.56 10 (89Ze02), 2.2 1 (85Ke11).
4551.6 7	5701.49	0.066 3			I γ : 0.05 1 (85Ke11).
x4579.8 9		0.056 3			
4629.08 27	5778.73	0.448 22			I γ : 0.67 9 (89Ze02), 0.50 3 (85Ke11).
4632.0 9	4710.58	0.139 7			I γ : 0.15 1 (85Ke11).
x4644.1 5		0.101 5			
4661.11 6	4661.53	3.52 18			I γ : 4.52 15 (89Ze02), 3.7 2 (85Ke11).
4671.39 5	(7935.65)	11.8 6			I γ : 13.42 31 (89Ze02), 12.8 6 (85Ke11).
4738.80 38	6062.14	0.213 11			I γ : 0.10 5 (89Ze02), 0.19 1 (85Ke11).
x4766.10 22		0.246 12			
4792.9 11	5307.58?	0.048 2			
4799.56 30	4877.45	0.186 9			I γ : 0.21 1 (85Ke11), 0.21 1 (85Ke11).
4811.2 10	5325.99?	0.064 3			
4860.5 9	(7935.65)	0.076 4			
4876.78 11	4877.45	0.634 32			I γ : 1.03 20 (89Ze02), 0.70 4 (85Ke11).
4912.30 11	6062.14	0.686 34			I γ : 0.74 10 (89Ze02), 0.77 4 (85Ke11).
x5067.9 17		0.045 2			
5071.4 13	5072.53	0.052 3	M1		I γ : 0.09 1 (85Ke11).
x5114.3 9		0.051 3			
x5122.3 5		0.086 4			
5180.9 8	6332.54	0.042 2			
5182.91@ 13	5696.22?				I γ : 0.10 4 (89Ze02), 0.21 1 (85Ke11).
5194.92 7	(7935.65)	1.29 6			I γ : 1.86 6 (89Ze02), 1.37 7 (85Ke11).
5228.0 8	5307.58?	0.044 2			
5265.47 7	5778.73	3.07 15			I γ : 3.34 14 (89Ze02), 3.2 2 (85Ke11).
5277.73 7	(7935.65)	1.12 6			I γ : 1.61 6 (89Ze02), 1.25 6 (85Ke11).
5306.7 9	5307.58?	0.044 2			
5326.8 9	5325.99?	0.040 2			
x5340.5 16		0.026 1			
5349.03 20	5349.65	0.237 12			I γ : 0.12 4 (89Ze02), 0.19 1 (85Ke11).
5355.2 9	(7935.65)	0.067 3			
5359.8 10	6510.36	0.061 1			
x5366.9 13		0.038 2			
x5379.2 5		0.081 4			
5431.35# 24	5509.41	0.162# 8			
	6581.89	0.162# 8			I γ : 0.10 1 (85Ke11).
x5437.9 14		0.026 1			
x5452.4 5		0.065 3			
x5474.85 29		0.118 6			
5508.2 6	5509.41	0.058 3			I γ : 0.04 1 (85Ke11).
5549.27 30	6062.14	0.142 7			I γ : 0.14 1 (85Ke11).
5622.17# 37	5701.49	0.095# 5			I γ : 0.13 1 (85Ke11).

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$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11 (continued) **$\gamma(^{32}\text{P})$ (continued)**

E_{γ}^{\dagger}	$E(\text{level})$	$I_{\gamma}^{\$}$	Comments
5622.17# 37	(7935.65)	0.095# 5	
5634.8 7	6783.69	0.047 2	
5683.20 12	6196.36	0.387 19	
5700.31 14	5778.73	0.610 30	I γ : 0.86 6 (89Ze02), 0.40 2 (85Ke11).
5705.40 7	(7935.65)	2.57 13	I γ : 0.54 6 (89Ze02), 0.67 3 (85Ke11).
5717.55 13	(7935.65)	0.397 20	I γ : 2.91 19 (89Ze02), 2.7 1 (85Ke11).
x5745.5 7		0.063 3	I γ : 0.22 5 (89Ze02), 0.42 2 (85Ke11).
x5751.69 47		0.107 5	
5758.05 5	(7935.65)	0.085 4	I γ : 0.014 3 (85Ke11).
5778.13 8	5778.73	0.959 48	I γ : 1.27 5 (89Ze02), 0.93 5 (85Ke11).
5983.4 6	6062.14	0.064 3	I γ : 0.05 1 (85Ke11).
x6050.5 7		0.052 3	
6061.40 12	6062.14	0.422 21	I γ : 0.30 6 (89Ze02), 0.44 2 (85Ke11).
x6091.60 46		0.148 7	
6117.63 32	6196.36	0.144 7	I γ : 0.10 3 (89Ze02), 0.14 1 (85Ke11).
6179.4 7	(7935.65)	0.055 3	I γ : 0.05 1 (85Ke11).
6195.87 13	6196.36	0.362 18	I γ : 0.37 10 (89Ze02), 0.37 2 (85Ke11).
6252.8 10	6332.54	0.036 2	
x6275.1 6		0.083 4	
x6281.45 39		0.152 8	
x6287.5 5		0.112 6	
x6294.25 26		0.183 9	
6332.01 19	6332.54	0.223 11	
x6397.5 24		0.039 2	
x6419.57 40		0.175 9	
6478.2 19	6557.99?	0.018 1	
x6496.7 22		0.027 1	
6503.17 27	6581.89	0.303 15	I γ : 0.16 3 (89Ze02), 0.28 1 (85Ke11).
6508.7 30	6510.36	0.020 1	
x6517.4 7		0.056 3	
6556.2 9	6557.99?	0.041 2	
6581.02 21	6581.89	0.202 10	I γ : 0.22 4 (89Ze02), 0.21 1 (85Ke11).
6612.02 40	(7935.65)	0.081 4	I γ : 0.08 1 (85Ke11).
x6671.0 12		0.042 2	
x6676.9 14		0.036 2	
x6759.3 8		0.050 2	
6785.48 7	(7935.65)	14.7 7	I γ : 15.56 22 (89Ze02), 15.5 8 (895ke11).
x6823.9 7		0.062 3	
x6836.4 8		0.052 3	
x6860.73 39		0.100 5	
x7018.4 8		0.051 3	
x7058.09 47		0.083 4	
x7160.5 6		0.068 3	
x7179.25 24		0.186 9	
x7244.72 44		0.090 5	
x7302.1 18		0.040 2	
x7336.48 24		0.184 9	
7422.05 8	(7935.65)	4.89 24	I γ : 5.56 22 (89Ze02), 4.9 3 (85Ke11).
x7769.7 6		0.048 2	
7856.65 9	(7935.65)	0.875 44	I γ : 1.05 7 (89Ze02), 0.91 5 (85Ke11).
x7914.98 48		0.034 2	
7934.68 11	(7935.65)	0.369 21	I γ : 0.35 5 (89Ze02), 0.40 2 (85Ke11).

[†] The given errors include systematic errors of 20ppm for $0 < E_{\gamma} \leq 2$ MeV; 15ppm for $2 < E_{\gamma} \leq 3$ MeV; 10ppm for $E_{\gamma} > 3$ MeV.

[‡] From adopted gammas, except as noted.

[§] For intensity per 100 neutron captures, multiply by 0.944.

[#] Multiply placed; undivided intensity given.

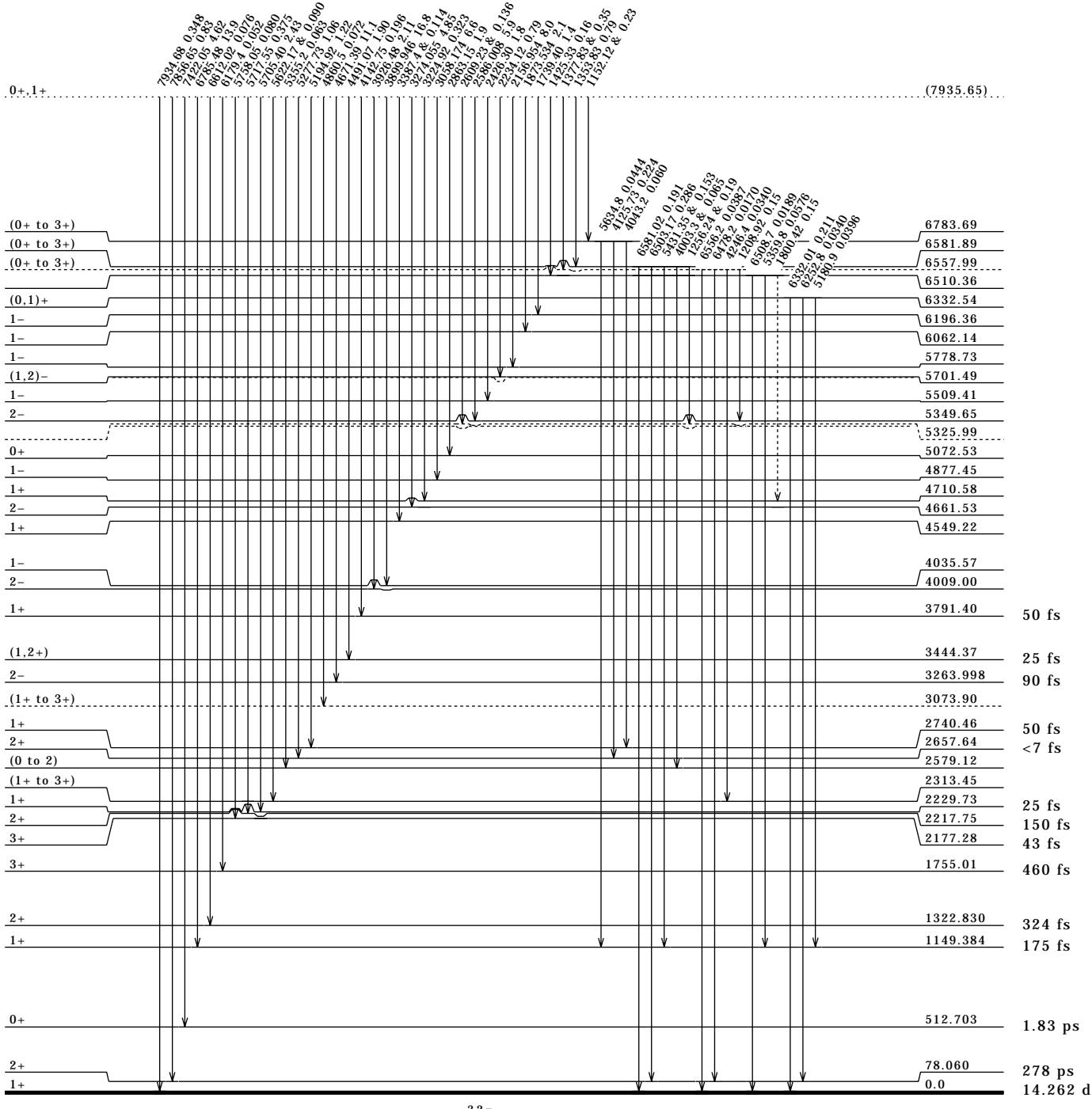
[@] Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11 (continued)

Level Scheme

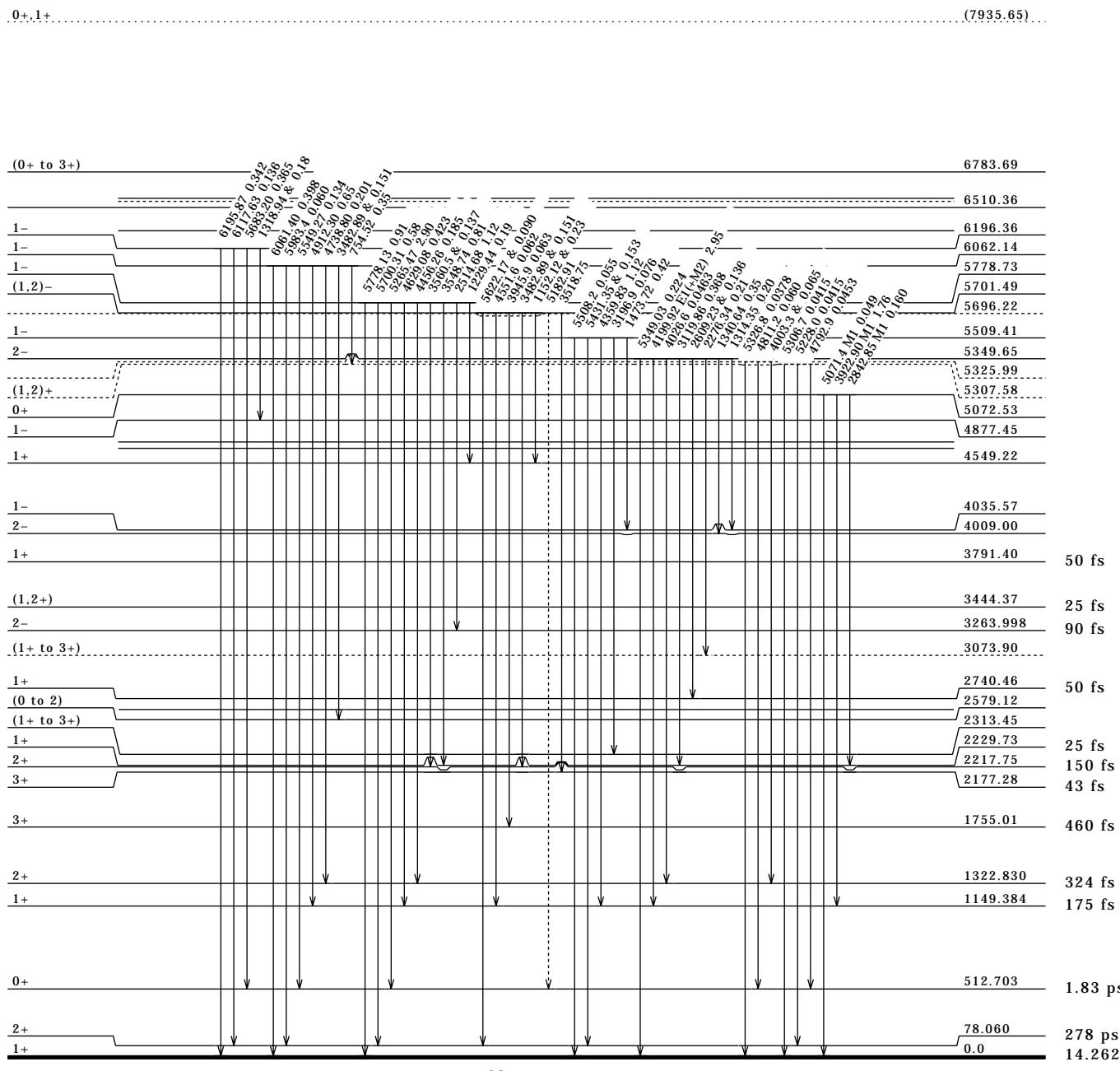
Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11 (continued)

Level Scheme (continued)

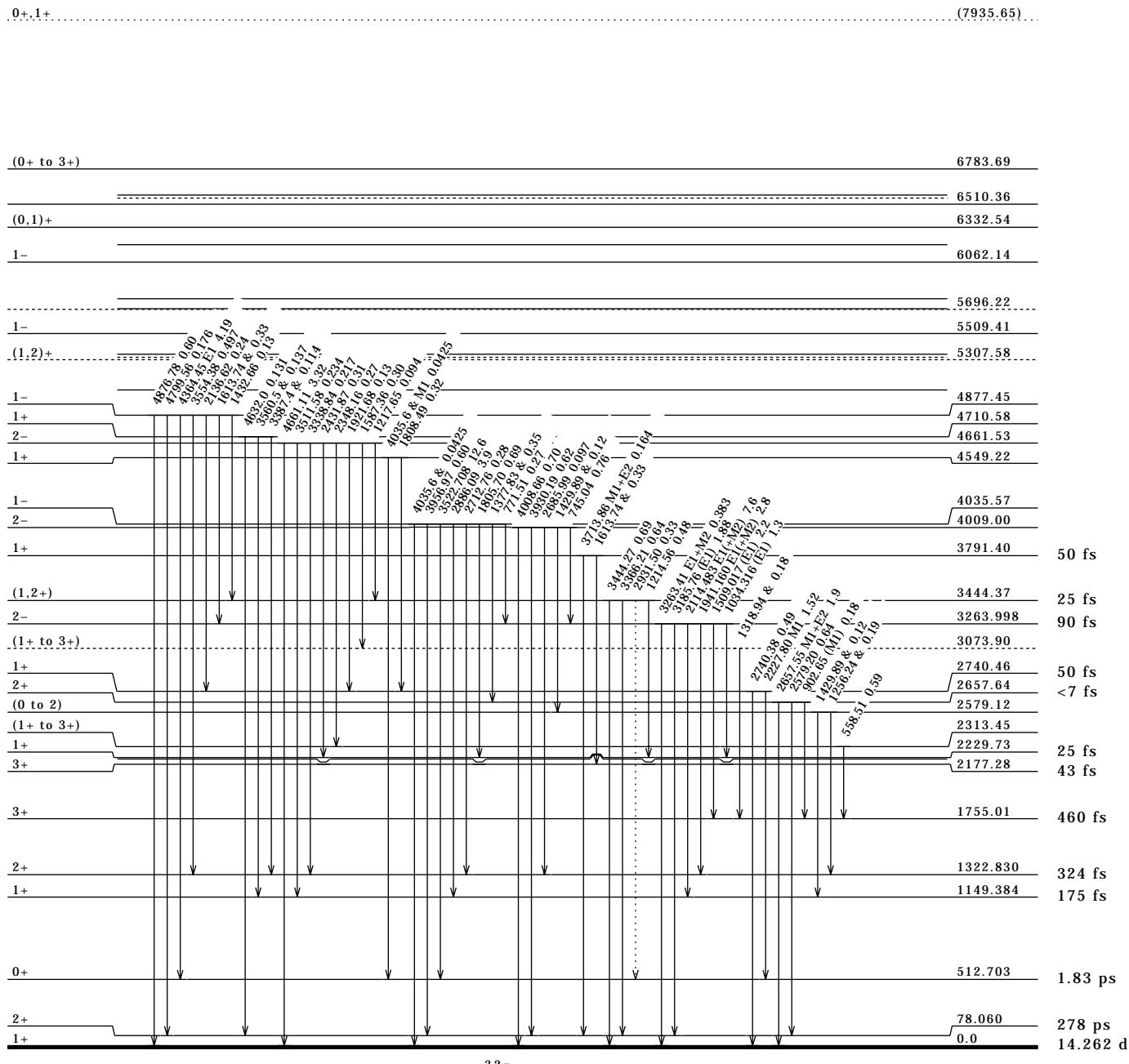
Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11 (continued)

Level Scheme (continued)

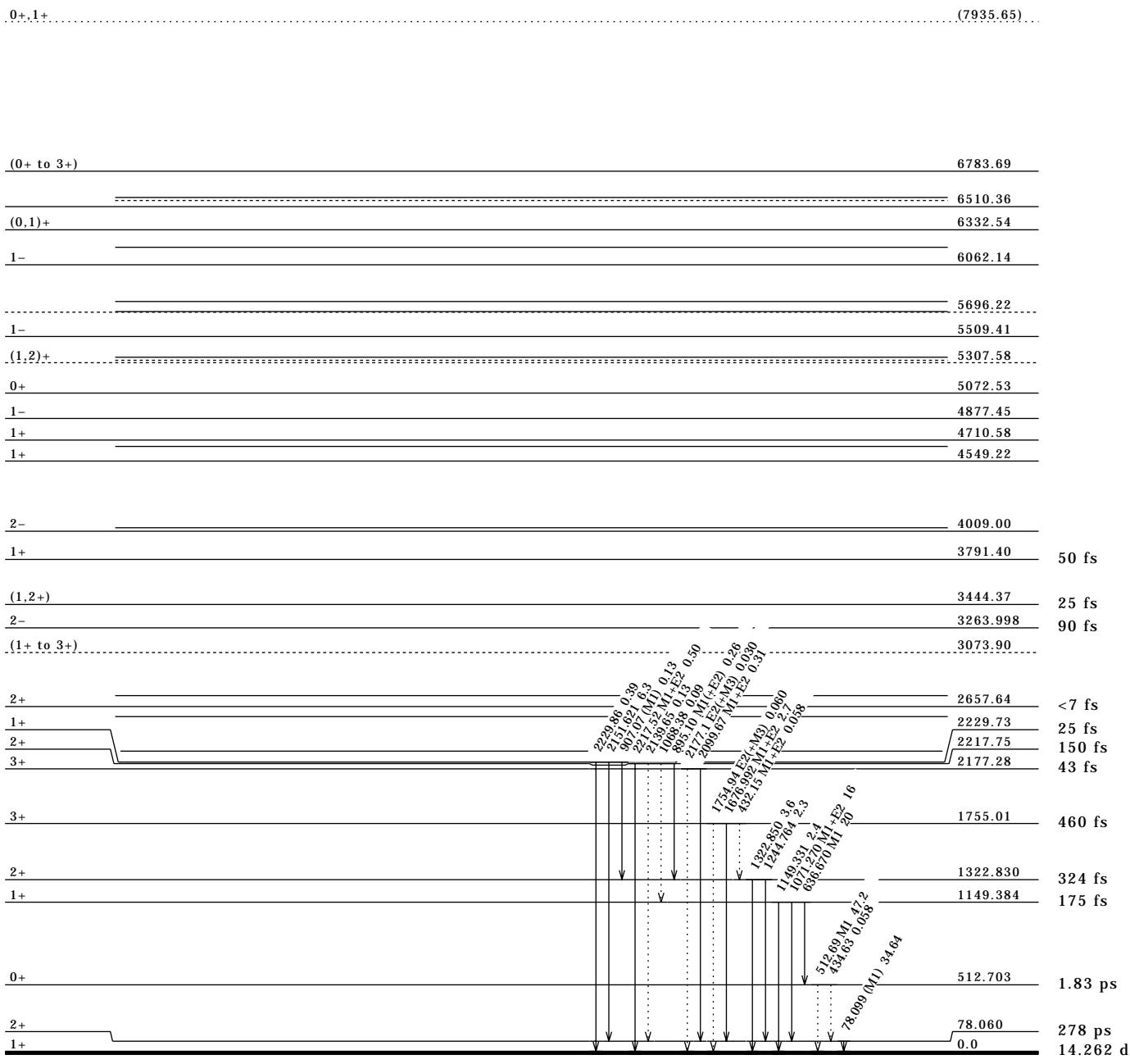
Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{31}\text{P}(\text{n},\gamma)$ E=thermal 89Mi16,89Ze02,85Ke11 (continued)

Level Scheme (continued)

Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{32}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15,85Ke08,Target $J\pi=0^+$.85Ra15: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl) in Compton-suppressed mode and pair spectrometer mode. Deduced neutron separation energy $S(n)=8641.912$ keV 23.85Ke08: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl). Deduced neutron separation energy $S(n)=8641.60$ keV 3.Other measured $S(n)=8641.912$ keV 53 (83Ra04), 8641.60 keV 7 (80Is02).Evaluated $S(n)=8641.58$ keV 3 (95Au04).Measured thermal-neutron capture cross section, $\sigma(n,\gamma)=518$ mb 14 (85Ra15). **^{33}S Levels**

E(level) [‡]	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0.0	$3/2^+$	stable	
840.995 12	$1/2^+$	1.17 ps 3	
1967.17 4	$5/2^+$	104 fs 14	
2313.439 14	$3/2^+$	107 ps 17	
2867.708 23	$5/2^+$	19 fs 8	
2935.18 20	$7/2^-$	28 fs 2	
2968.6 1	$7/2^+$	62 ps 11	
3220.746 14	$3/2^-$	28 fs 8	
3832.1 9	$5/2^+$	31 fs 6	
3934.93 6	$3/2^+$	24 fs 5	
4055.51 18	$1/2^+$	12 fs 8	
4144.49 6	$5/2$	24 fs 5	
4210.92 3	$3/2^-$	32 fs 5	
4423.81 13	($1/2^+, 3/2$)	19 fs 9	
4918.079 19	$1/2^-$	90 fs 25	
5286.1 3	($1/2, 3/2, 5/2^+$)		
5480.1 3	$1/2^+$		
5613.11 5	$1/2^+$		
5711.051 18	$1/2^-$		
5888.58 3	$3/2^-$		
6425.09 3	($1/2, 3/2$)		
6676.97 4	($1/2^+ \text{ to } 5/2^+$)		
7187.96 3	$3/2^-$		
7416.13 3	($1/2, 3/2$)		
7488.47 16	($1/2, 3/2, 5/2^+$)		
7506.56 3	($1/2, 3/2, 5/2^+$)		
7616.00 4	($1/2^+, 3/2, 5/2^+$)		
8368.33 4	($1/2, 3/2, 5/2^+$)		
(8641.58 3)	$1/2^+$		E(level): from evaluated $S(n)$ (95Au04). $J\pi$: from s-wave neutron capture. Observed deexcitation intensity is 101% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From $E\gamma$'s using least-squares fit to data, except as noted. **$\gamma(^{33}\text{S})$**

All data are from 85Ra15, except as noted.

 $I\gamma$ normalization: renormalized from assuming $I(\gamma+ce)$ (to g.s.)=100.

$E\gamma$	E(level)	$I\gamma^\#&$	Mult. [®]	δ^\circledast	$I(\gamma+ce)^\&$	Comments
97.90 4	5711.051	0.0181 20	E1		0.0138	$\sigma(n,\gamma)=0.092$ mb 10 (85Ra15).
273.559 24	(8641.58)	0.067 8				$\sigma(n,\gamma)=0.34$ mb 4 (85Ra15).
346.19 14	2313.439	0.028 6				$\sigma(n,\gamma)=0.141$ mb 27 (85Ra15).
353.034 19	3220.746	0.28 3				$\sigma(n,\gamma)=1.41$ mb 14 (85Ra15).
707.07 16	4918.079	0.022 4				$\sigma(n,\gamma)=0.11$ mb 2 (85Ra15).
840.974 14	840.995	68.0 70	M1+E2	0.151 4		$\sigma(n,\gamma)=345$ mb 32 (85Ra15).
x856.44 17		0.037 6				$\sigma(n,\gamma)=0.19$ mb 3 (85Ra15).
862.55 19	4918.079	0.022 4				$\sigma(n,\gamma)=0.11$ mb 2 (85Ra15).
907.315 20	3220.746	0.28 3				$\sigma(n,\gamma)=1.42$ mb 13 (85Ra15).
923.48 24	4144.49	0.023 6				$\sigma(n,\gamma)=0.117$ mb 26 (85Ra15).
967.91 32	2935.18	0.020 5	E1 (+M2)	-0.02 2		$\sigma(n,\gamma)=0.104$ mb 21 (85Ra15).
970.0 6	5888.58	0.012 6				$\sigma(n,\gamma)=0.06$ mb 3 (85Ra15).
983.20 7	4918.079	0.055 8				$\sigma(n,\gamma)=0.28$ mb 4 (85Ra15).

Continued on next page (footnotes at end of table)

$^{32}\text{S}(\text{n},\gamma)$ E=thermal 85RA15,85KE08, (continued) **$\gamma(^{33}\text{S})$ (continued)**

$E\gamma$	$E(\text{level})$	$I\gamma^{\#&}$	Mult. [@]	δ°	Comments
1025.874 31	(8641.58)	0.160 16			$\sigma(n,\gamma)=0.81 \text{ mb } 8$ (85Ra15).
1067.1 [†] 3	3934.93	0.006 [†] 4			$\sigma(n,\gamma)=0.03 \text{ mb } 2$ (85Ra15).
x1092.48 15		0.063 10			$\sigma(n,\gamma)=0.32 \text{ mb } 5$ (85Ra15).
(1126.16)	1967.17	0.0099 20			$\sigma(n,\gamma)=0.05 \text{ mb } 1$.
1135.314 17	(8641.58)	0.49 5			$\sigma(n,\gamma)=2.48 \text{ mb } 23$ (85Ra15).
1153.40 ^S 16	(8641.58)	0.039 ^S 12			$\sigma(n,\gamma)=0.20 \text{ mb } 6$ (85Ra15).
x1164.71 23		0.028 8			$\sigma(n,\gamma)=0.14 \text{ mb } 4$ (85Ra15).
1209.23 27	4144.49	0.026 5			$\sigma(n,\gamma)=0.134 \text{ mb } 21$ (85Ra15).
1225.744 15	(8641.58)	0.67 8			$\sigma(n,\gamma)=3.4 \text{ mb } 4$ (85Ra15).
1253.59 4	3220.746	0.189 20			$\sigma(n,\gamma)=0.96 \text{ mb } 10$ (85Ra15).
1453.900 19	(8641.58)	0.56 6			$\sigma(n,\gamma)=2.83 \text{ mb } 26$ (85Ra15).
1472.411 13	2313.439	1.81 18	M1+E2	-0.35 3	$\sigma(n,\gamma)=9.2 \text{ mb } 9$ (85Ra15).
1500.15 13	5711.051	0.039 8			$\sigma(n,\gamma)=0.20 \text{ mb } 4$ (85Ra15).
1518.7 [†] 20	3832.1	0.010 [†] 4	M1+E2	-0.23 10	$\sigma(n,\gamma)=0.05 \text{ mb } 2$ (85Ra15).
1621.4 [†] 3	3934.93	0.0039 [†] 20			$\sigma(n,\gamma)=0.02 \text{ mb } 1$ (85Ra15).
1677.96 ^a 10	5613.11	0.081 ^a 12			$\sigma(n,\gamma)=0.41 \text{ mb } 6$ (85Ra15).
	5888.58	0.081 ^a 12			$\sigma(n,\gamma)=0.41 \text{ mb } 6$ (85Ra15).
1697.296 14	4918.079	2.7 3			I γ : 2.18 15 (85Ke08).
					$\sigma(n,\gamma)=13.5 \text{ mb } 13$ (85Ra15).
1744.06 7	5888.58	0.195 22			$\sigma(n,\gamma)=0.99 \text{ mb } 11$ (85Ra15).
1897.48 4	4210.92	0.42 4	(E1)		$\sigma(n,\gamma)=2.11 \text{ mb } 20$ (85Ra15).
1964.841 31	(8641.58)	1.40 14			I γ : 1.14 11 (85Ke08).
					$\sigma(n,\gamma)=7.1 \text{ mb } 7$ (85Ra15).
1967.13 6	1967.17	0.81 10	M1+E2	-0.56 3	I γ : 0.69 8 (85Ke08).
					$\sigma(n,\gamma)=4.1 \text{ mb } 5$ (85Ra15).
1967.6 [†] 3	3934.93	0.012 [†] 6			$\sigma(n,\gamma)=0.06 \text{ mb } 3$ (85Ra15).
2110.3 4	4423.81	0.024 8			$\sigma(n,\gamma)=0.12 \text{ mb } 4$ (85Ra15).
2214.00 8	6425.09	0.47 6			$\sigma(n,\gamma)=2.40 \text{ mb } 29$ (85Ra15).
2216.729 18	(8641.58)	2.62 24			I γ : 1.9 1 (85Ke08).
					$\sigma(n,\gamma)=13.3 \text{ mb } 12$ (85Ra15).
2280.54 15	6425.09	0.112 20			$\sigma(n,\gamma)=0.57 \text{ mb } 10$ (85Ra15).
2313.401 23	2313.439	0.77 8	M1+E2	-33 +73 -67	I γ : 0.73 9 (85Ke08).
					$\sigma(n,\gamma)=3.9 \text{ mb } 4$ (85Ra15).
2379.657 11	3220.746	45 5	E1 (+M2)	0.00 2	I γ : 42.9 7 (85Ke08).
					$\sigma(n,\gamma)=230 \text{ mb } 21$ (85Ra15).
2456.12 24	4423.81	0.063 10			$\sigma(n,\gamma)=0.32 \text{ mb } 5$ (85Ra15).
2465.84 14	6676.97	0.075 14			$\sigma(n,\gamma)=0.38 \text{ mb } 7$ (85Ra15).
2490.221 14	5711.051	2.7 3			I γ : 2.52 16 (85Ke08).
					$\sigma(n,\gamma)=13.5 \text{ mb } 13$ (85Ra15).
2532.07 28	6676.97	0.051 8			$\sigma(n,\gamma)=0.26 \text{ mb } 4$ (85Ra15).
2667.72 15	5888.58	0.75 10			I γ : 0.73 9 (85Ke08).
					$\sigma(n,\gamma)=3.8 \text{ mb } 5$ (85Ra15).
2753.26 6	(8641.58)	5.7 6			I γ : 5.7 2 (85Ke08).
					$\sigma(n,\gamma)=28.7 \text{ mb } 28$ (85Ra15).
2867.54 8	2867.708	0.95 10	M1+E2	+0.114 9	I γ : 0.82 9 (85Ke08).
					$\sigma(n,\gamma)=4.8 \text{ mb } 5$ (85Ra15).
2930.71 7	(8641.58)	17.1 18			I γ : 17.0 4 (85Ke08).
					$\sigma(n,\gamma)=87 \text{ mb } 9$ (85Ra15).
2935.0 [†] 6	2935.18	0.017 [†] 4	M2+E3	-0.15 2	$\sigma(n,\gamma)=0.088 \text{ mb } 19$ (85Ra15).
2973.0 9	5286.1	0.14 3			I γ : 0.11 2 (85Ke08).
					$\sigma(n,\gamma)=0.70 \text{ mb } 15$ (85Ra15).
3020.35 31	5888.58	0.21 5			I γ : 0.19 3 (85Ke08).
					$\sigma(n,\gamma)=1.05 \text{ mb } 23$ (85Ra15).
3029.1 5	(8641.58)	0.18 4			$\sigma(n,\gamma)=0.93 \text{ mb } 20$ (85Ra15).
3093.7 [†] 3	3934.93	0.016 [†] 6			$\sigma(n,\gamma)=0.08 \text{ mb } 3$ (85Ra15).
3161.60 34	(8641.58)	0.15 3			I γ : 0.08 1 (85Ke08).
					$\sigma(n,\gamma)=0.74 \text{ mb } 15$ (85Ra15).
3220.59 5	3220.746	24.4 24	E1 (+M2)	0.00 9	I γ : 24.8 5 (85Ke08).
					$\sigma(n,\gamma)=124 \text{ mb } 12$ (85Ra15).
3355.35 34	(8641.58)	0.16 4			$\sigma(n,\gamma)=0.81 \text{ mb } 18$ (85Ra15).
3369.78 6	4210.92	5.3 6	E1 (+M2)	-0.005 18	I γ : 5.5 2 (85Ke08).
					$\sigma(n,\gamma)=26.7 \text{ mb } 26$ (85Ra15).

Continued on next page (footnotes at end of table)

$^{32}\text{S}(\text{n},\gamma)$ E=thermal 85RA15,85KE08, (continued) **$\gamma(^{33}\text{S})$ (continued)**

E γ	E(level)	I $\gamma^{\#}$ &	Mult. [®]	Comments
3397.51 8	5711.051	1.10 12		I γ : 1.06 10 (85Ke08). $\sigma(n,\gamma)=5.6$ mb 6 (85Ra15).
3455.75 25	6676.97	0.19 4		I γ : 0.19 3 (85Ke08). $\sigma(n,\gamma)=0.96$ mb 16 (85Ra15).
3582.74 29	4423.81	0.071 18		I γ : 0.07 1 (85Ke08). $\sigma(n,\gamma)=0.36$ mb 9 (85Ra15).
3723.68 4	(8641.58)	2.7 3		I γ : 2.72 16 (85Ke08). $\sigma(n,\gamma)=13.5$ mb 13 (85Ra15).
3809.2 5	6676.97	0.065 16		I γ : 0.061 9 (85Ke08). $\sigma(n,\gamma)=0.33$ mb 8 (85Ra15).
3831.9 9	3832.1	0.033 10		$\sigma(n,\gamma)=0.17$ mb 5 (85Ra15).
3920.99 22	5888.58	0.136 18		$\sigma(n,\gamma)=0.69$ mb 9 (85Ra15).
3934.7 12	3934.93	0.057 14		$\sigma(n,\gamma)=0.29$ mb 7 (85Ra15).
4055.2 5	4055.51	0.057 16		I γ : 0.049 7 (85Ke08). $\sigma(n,\gamma)=0.29$ mb 8 (85Ra15).
4076.2 7	4918.079	0.069 20	E1	$\sigma(n,\gamma)=0.35$ mb 10 (85Ra15).
4144.36 14	4144.49	0.28 4		I γ : 0.30 4 (85Ke08). $\sigma(n,\gamma)=1.41$ mb 18 (85Ra15).
4217.53 21	(8641.58)	0.22 3		I γ : 0.22 3 (85Ke08). $\sigma(n,\gamma)=1.14$ mb 15 (85Ra15).
4363.14 13	6676.97	0.31 4		I γ : 0.31 5 (85Ke08). $\sigma(n,\gamma)=1.57$ mb 18 (85Ra15).
4423.5 5	4423.81	0.18 4		$\sigma(n,\gamma)=0.90$ mb 20 (85Ra15).
4430.75 5	(8641.58)	5.0 5		I γ : 5.0 2 (85Ke08). $\sigma(n,\gamma)=25.2$ mb 23 (85Ra15).
4444.1 5	5286.1	0.16 6		I γ : 0.13 2 (85Ke08). $\sigma(n,\gamma)=0.80$ mb 28 (85Ra15).
4638.8 [‡] 8	5480.1	0.12 [‡] 3		$\sigma(n,\gamma)=0.63$ mb 14 (85Ra15).
4708.7 5	6676.97	0.100 22		I γ : 0.093 14 (85Ke08). $\sigma(n,\gamma)=0.51$ mb 11 (85Ra15).
4771.1 4	5613.11	0.14 4		I γ : 0.12 2 (85Ke08). $\sigma(n,\gamma)=0.73$ mb 16 (85Ra15).
4869.56 4	5711.051	12.8 12	E1	I γ : 12.7 4 (85Ke08). $\sigma(n,\gamma)=65$ mb 6 (85Ra15).
4917.7 6	4918.079	0.11 3		I γ : 0.12 2 (85Ke08). $\sigma(n,\gamma)=0.56$ mb 13 (85Ra15).
5047.14 4	5888.58	3.2 3		I γ : 3.2 2 (85Ke08). $\sigma(n,\gamma)=16.2$ mb 15 (85Ra15).
5420.58 4	(8641.58)	59 6		I γ : 60.0 8 (85Ke08). $\sigma(n,\gamma)=302$ mb 27 (85Ra15).
5479.7 8	5480.1	0.022 8		$\sigma(n,\gamma)=0.11$ mb 4 (85Ra15).
5583.68 8	6425.09	1.48 16		I γ : 1.6 1 (85Ke08). $\sigma(n,\gamma)=7.5$ mb 8 (85Ra15).
5648.4 6	7616.00	0.059 16		I γ : 0.054 8 (85Ke08). $\sigma(n,\gamma)=0.30$ mb 8 (85Ra15).
5710.40 25	5711.051	0.18 3		I γ : 0.20 3 (85Ke08). $\sigma(n,\gamma)=0.91$ mb 13 (85Ra15).
5773.8 5	(8641.58)	0.071 14		I γ : 0.09 1 (85Ke08). $\sigma(n,\gamma)=0.36$ mb 7 (85Ra15).
5835.61 20	6676.97	0.162 22		I γ : 0.15 2 (85Ke08). $\sigma(n,\gamma)=0.82$ mb 11 (85Ra15).
5888.09 8	5888.58	0.75 8		I γ : 0.80 9 (85Ke08). $\sigma(n,\gamma)=3.8$ mb 4 (85Ra15).
6327.79 23	(8641.58)	0.126 16		I γ : 0.12 2 (85Ke08). $\sigma(n,\gamma)=0.64$ mb 8 (85Ra15).
6345.8 9	7187.96	0.017 5		I γ : 0.017 3 (85Ke08). $\sigma(n,\gamma)=0.084$ mb 24 (85Ra15).
6424.72 28	6425.09	0.110 18		I γ : 0.13 2 (85Ke08). $\sigma(n,\gamma)=0.56$ mb 9 (85Ra15).
6574.93 22	7416.13	0.118 18		I γ : 0.12 2 (85Ke08). $\sigma(n,\gamma)=0.60$ mb 9 (85Ra15).
6664.82 15	7506.56	0.23 3		I γ : 0.22 3 (85Ke08). $\sigma(n,\gamma)=1.15$ mb 13 (85Ra15).

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$^{32}\text{S}(\text{n},\gamma)$ E=thermal 85RA15,85KE08, (continued) **$\gamma(^{33}\text{S})$ (continued)**

E γ	E(level)	I $\gamma^{\# \&}$	Comments
6676.13 13	6676.97	0.31 4	I γ : 0.23 3 (85Ke08). $\sigma(n,\gamma)=1.58$ mb 16 (85Ra15).
x6958.3 5		0.045 10	$\sigma(n,\gamma)=0.23$ mb 5 (85Ra15).
7187.19 15	7187.96	0.30 4	I γ : 0.33 5 (85Ke08). $\sigma(n,\gamma)=1.54$ mb 17 (85Ra15).
7415.31 15	7416.13	0.44 5	I γ : 0.47 7 (85Ke08). $\sigma(n,\gamma)=2.25$ mb 25 (85Ra15).
7487.6 9	7488.47	0.035 8	$\sigma(n,\gamma)=0.18$ mb 4 (85Ra15).
7505.6 4	7506.56	0.162 22	I γ : 0.12 2 (85Ke08). $\sigma(n,\gamma)=0.82$ mb 11 (85Ra15).
7528.2 9	8368.33	0.020 6	$\sigma(n,\gamma)=0.10$ mb 3 (85Ra15).
x7614.9 6		0.051 10	$\sigma(n,\gamma)=0.26$ mb 5 (85Ra15).
7799.77 12	(8641.58)	2.7 3	I γ : 2.89 17 (85Ke08). $\sigma(n,\gamma)=13.7$ mb 14 (85Ra15).
8366.8 6	8368.33	0.030 6	$\sigma(n,\gamma)=0.15$ mb 3 (85Ra15).
8640.45 12	(8641.58)	1.81 18	I γ : 2.02 14 (85Ke08). $\sigma(n,\gamma)=9.2$ mb 9 (85Ra15).

† Not observed but inferred from the known level branching ratios.

‡ Not observed but inferred from the intensity balance requirement and the known branching ratio.

§ After corrections due to a γ -ray of similar energy in the $^{33}\text{S}(\text{n},\gamma)^{34}\text{S}$ reaction.# Absolute intensities per 100 neutron captures. For γ -ray cross section in mb (85Ra15), multiply by 5.076 per 100 neutron captures.

@ From adopted gammas, except as noted.

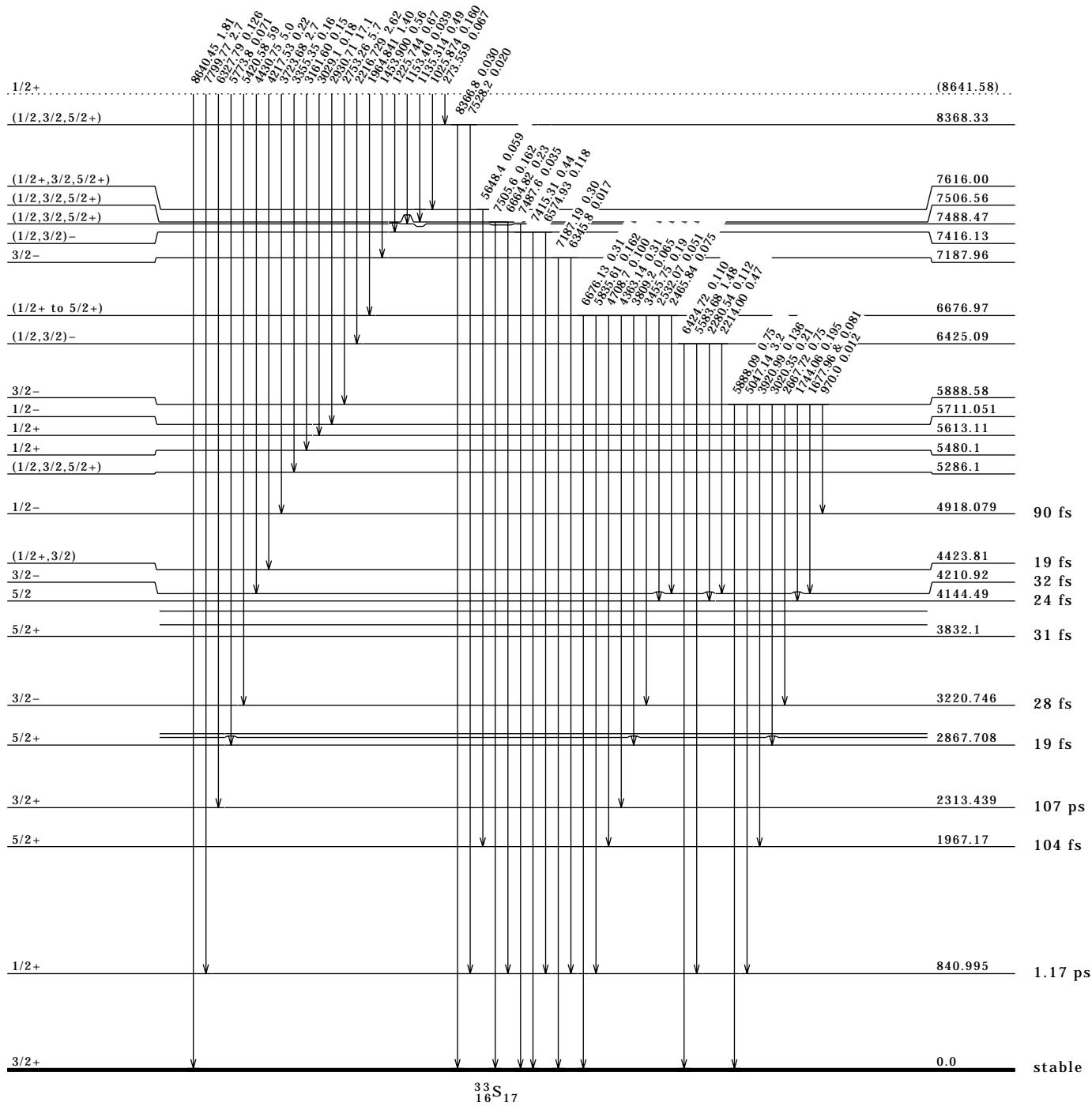
& For intensity per 100 neutron captures, multiply by 1.

a Multiply placed; undivided intensity given.

x γ ray not placed in level scheme.

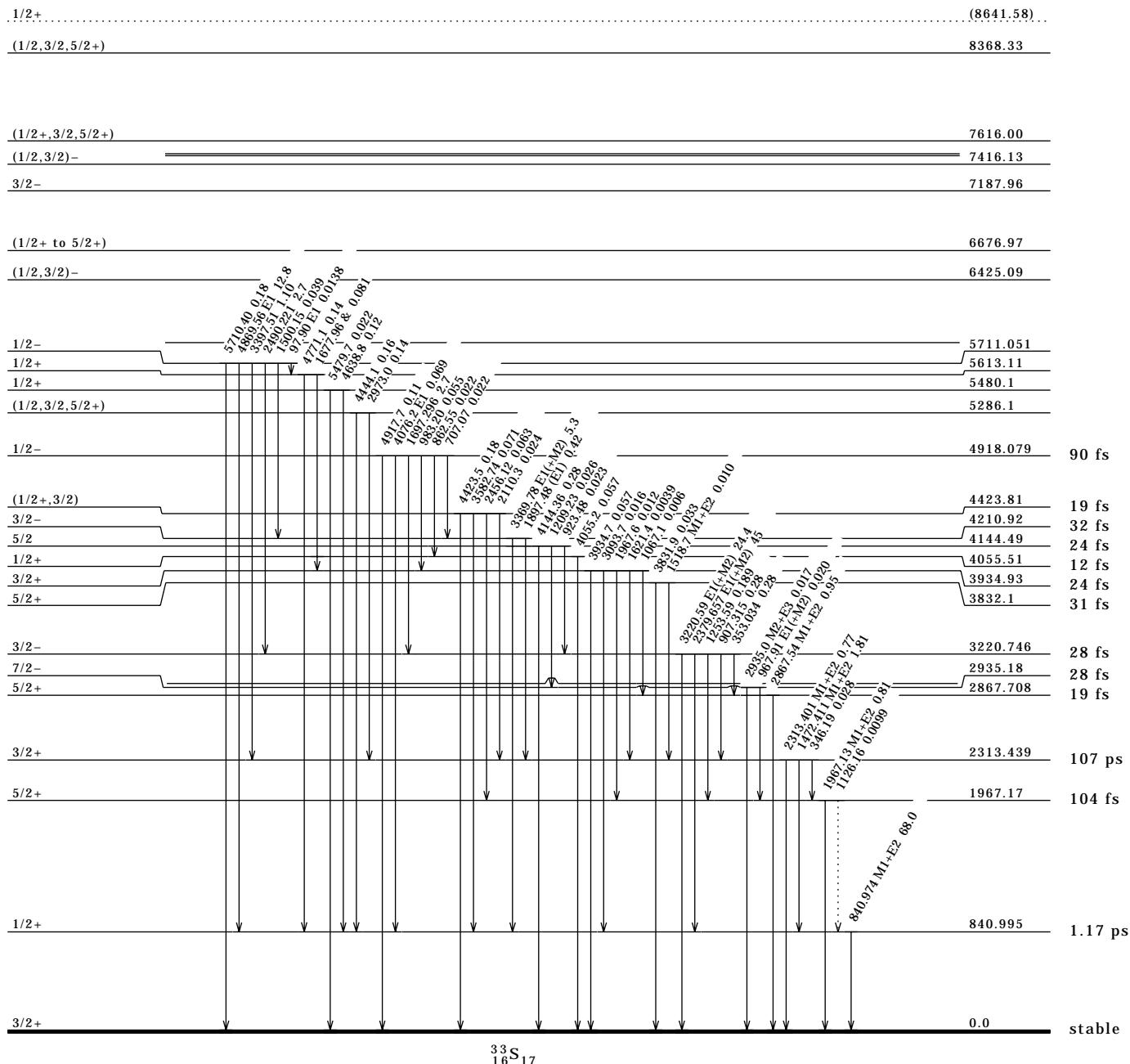
$^{32}\text{S}(\text{n},\gamma)$ E=thermal 85RA15,85KE08, (continued)Level Scheme

Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{32}\text{S}(\text{n},\gamma)$ E=thermal 85RA15,85KE08, (continued)**Level Scheme (continued)**

Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15Target $J\pi=3/2^+$.85Ra15: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl) in Compton-suppressed mode and pair spectrometer mode. Deduced neutron separation energy $S(n)=11417.217$ keV 46.Other measured $S(n)=11417.12$ keV 10 (83Ra04).Evaluated $S(n)=11416.94$ keV 5 (95Au04).Measured thermal-neutron capture cross section, $\sigma(n,\gamma)=454$ mb 25 (85Ra15). **^{34}S Levels**

E(level) [‡]	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0.0	0+	stable	
2127.566 13	2+	325 fs 9	
3304.216 13	2+	135 fs 10	
3916.410 21	0+	1.11 ps 18	
4074.669 14	1+	<20 fs	
4114.815 23	2+	70 fs 10	
4624.410 16	3-	90 fs 10	
4688.98 4	4+	85 fs 10	
4876.846 24	3+	<50 fs	
4889.758 22	2+	<30 fs	
5228.178 23	0+		
5322.52 3	2-	17 fs 7	
5380.99 4	1+	<50 fs	
5679.932 17	(2,3)-	265 fs 45	
5755.882 21	1-		
5847.53 3	0+		
5998.10 8	2+	<7 fs	
6121.56 10	2+	<50 fs	
6168.87 3	3-	<9 fs	
6251.23 19	4+	270 fs 55	
6251.68 9	(1,3)-	0.42 ps +49-21	
6342.53 10	1-	<25 fs	
6421.35 8	4-	<7 fs	
6428.13 8	2+		
6478.773 22	(1,2)-		
6685.34 3	(0 to 3)-		
6828.83 18	2+	<45 fs	
6847.90 7	(1,2+)		
6954.22 3	2-		
7110.46 4	3-	<7 fs	
7164.47 17	(0+ to 3+)		
7219.29 7	1-	0.33 fs 10	
7248.05 11	2+	14 fs 6	
7367.43 10	(1,2)+		
7467.74 10	(0+ to 3+)		
7552.70 8	(1 to 3-)		
7629.912 21	3-	14 fs 8	
7730.80 15	(0+ to 3+)		
7781.22 6	1-	0.52 fs 8	
7974.72 16	(1,2+)		
8036.31 14	(1-,2+)		
8138.09 7	1-		
8174.9 4	(1,2+)		
8185.46 13	1+	0.6 fs 2	
8205.41 8	(1- to 4+)		
8294.40 9	(0+ to 3-)		
8385.41 6	1-	0.9 fs 3	
8506.78 4	1-	0.28 fs 6	
8615.74 4	(2,3+)		
8702.35 13	(1 to 3+)		
8727.64 8	(1-,2+)		
8805.63 24	(1,2+)		
8874.02 6	(1- to 3+)		
9026.31 6	(1,2+)		
9158.72 3	(1,2+)		
9208.04 6	(1,2+)		

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$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued) **^{34}S Levels (continued)**

E(level) [†]	Jπ [†]	Comments
9546.09 7	(1, 2+)	
9598.42 8		
9665.75 4		
9801.89 10	(1, 2+)	
9836.70 6		
9933.37 12	1-	
10092.21 15		
10179.60 6	(1, 2, 3)	
10212.16 5	(1, 2, 3)	
10311.54 3	2+	
10650.13 19		
10840.62 15	3-	
11024.95 11	1-	
(11416.94 5)	1+, 2+	E(level): from evaluated S(n) (95Au04). Jπ: from s-wave neutron capture. Observed deexcitation intensity is 85% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From Eγ's using least-squares fit to data, except as noted. **$\gamma(^{34}\text{S})$**

All data are from 85Ra15, except as noted.

Iγ normalization: renormalized from assuming Iγ(to g.s.)=100.

Eγ	E(level)	Iγ [§]	Mult.#	δ#	I(γ+ce) [¶]	Comments
x95.45 18		0.0026 7				$\sigma(n,\gamma)=0.012 \text{ mb}$ 3 (85Ra15).
x229.71 16		0.0119 22				$\sigma(n,\gamma)=0.054 \text{ mb}$ 10 (85Ra15).
281.34 24	7110.46	0.0051 18				$\sigma(n,\gamma)=0.023 \text{ mb}$ 8 (85Ra15).
306.63 16	6428.13	0.020 5				$\sigma(n,\gamma)=0.089 \text{ mb}$ 20 (85Ra15).
334.21 15	9208.04	0.0092 22				$\sigma(n,\gamma)=0.042 \text{ mb}$ 10 (85Ra15).
392.28 11	(11416.94)	0.027 5				$\sigma(n,\gamma)=0.124 \text{ mb}$ 20 (85Ra15).
516.86 12	8702.35	0.070 11				$\sigma(n,\gamma)=0.32 \text{ mb}$ 5 (85Ra15).
571.7 6	6251.68	0.018 7				$\sigma(n,\gamma)=0.08 \text{ mb}$ 3 (85Ra15).
576.80 19	(11416.94)	0.032 5				$\sigma(n,\gamma)=0.146 \text{ mb}$ 21 (85Ra15).
612.16 5	3916.410	0.058 7	E2			$\sigma(n,\gamma)=0.263 \text{ mb}$ 28 (85Ra15).
631.13 6	6478.773	0.062 7				$\sigma(n,\gamma)=0.283 \text{ mb}$ 31 (85Ra15).
672.00 10	9546.09	0.033 5				$\sigma(n,\gamma)=0.152 \text{ mb}$ 20 (85Ra15).
698.18 13	5322.52	0.022 3	(M1)			$\sigma(n,\gamma)=0.101 \text{ mb}$ 14 (85Ra15).
722.95 14	6478.773	0.039 5				$\sigma(n,\gamma)=0.175 \text{ mb}$ 22 (85Ra15).
725.25 22	9933.37	0.025 5				$\sigma(n,\gamma)=0.115 \text{ mb}$ 19 (85Ra15).
x743.50 20		0.022 4				$\sigma(n,\gamma)=0.098 \text{ mb}$ 15 (85Ra15).
748.43 14	10840.62	0.028 4				$\sigma(n,\gamma)=0.127 \text{ mb}$ 17 (85Ra15).
x752.30 8		0.049 6				$\sigma(n,\gamma)=0.222 \text{ mb}$ 26 (85Ra15).
767.20 21	(11416.94)	0.022 4				$\sigma(n,\gamma)=0.098 \text{ mb}$ 16 (85Ra15).
770.428 20	4074.669	0.61 6				$\sigma(n,\gamma)=2.75 \text{ mb}$ 25 (85Ra15).
789.1 6	5679.932	0.086 16	(E1)			$\sigma(n,\gamma)=0.39 \text{ mb}$ 7 (85Ra15).
798.92 10	6478.773	0.064 9				$\sigma(n,\gamma)=0.29 \text{ mb}$ 4 (85Ra15).
803.103 27	5679.932	0.251 25	(E1)			$\sigma(n,\gamma)=1.14 \text{ mb}$ 11 (85Ra15).
846.1 13	6168.87	0.06 4				$\sigma(n,\gamma)=0.28 \text{ mb}$ 18 (85Ra15).
925.79 14	8036.31	0.038 5				$\sigma(n,\gamma)=0.171 \text{ mb}$ 21 (85Ra15).
929.436 21	6685.34	0.235 22				$\sigma(n,\gamma)=1.07 \text{ mb}$ 10 (85Ra15).
941.59 6	7110.46	0.090 11				$\sigma(n,\gamma)=0.41 \text{ mb}$ 5 (85Ra15).
982.68 9	9598.42	0.041 6				$\sigma(n,\gamma)=0.187 \text{ mb}$ 27 (85Ra15).
989.08& 28	7110.46	0.017& 5				$\sigma(n,\gamma)=0.079 \text{ mb}$ 23 (85Ra15).
	7467.74	0.017& 5				$\sigma(n,\gamma)=0.079 \text{ mb}$ 23 (85Ra15).
x1029.23 8		0.070 9				$\sigma(n,\gamma)=0.32 \text{ mb}$ 4 (85Ra15).
x1035.82 17		0.024 7				$\sigma(n,\gamma)=0.108 \text{ mb}$ 31 (85Ra15).
1055.491 20	5679.932	1.54 16				$\sigma(n,\gamma)=7.0 \text{ mb}$ 7 (85Ra15).
1105.673 21	(11416.94)	0.33 3				$\sigma(n,\gamma)=1.49 \text{ mb}$ 14 (85Ra15).
1113.27 9	5228.178	0.090 14	E1			$\sigma(n,\gamma)=0.41 \text{ mb}$ 6 (85Ra15).
1121.33 9	5998.10	0.077 11	(M1)			$\sigma(n,\gamma)=0.35 \text{ mb}$ 5 (85Ra15).

Continued on next page (footnotes at end of table)

$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued) $\gamma(^{34}\text{S})$ (continued)

$E\gamma$	E(level)	$I_F^S @$	Mult.#	$\delta^{\#}$	$I(\gamma+ce) @$	Comments
1153.492 20	5228.178	2.20 20	M1			$\sigma(n,\gamma)=10.0 \text{ mb } 9$ (85Ra15).
1156.39 7	6478.773	0.35 4				$\sigma(n,\gamma)=1.57 \text{ mb } 18$ (85Ra15).
x1164.83 25		0.046 13				$\sigma(n,\gamma)=0.21 \text{ mb } 6$ (85Ra15).
1176.650 20	3304.216	16.5 16	M1+E2	-0.16 2		$\sigma(n,\gamma)=75 \text{ mb } 7$ (85Ra15).
1205.05 4	(11416.94)	0.134 14				$\sigma(n,\gamma)=0.61 \text{ mb } 6$ (85Ra15).
1210.04 13	7552.70	0.036 5				$\sigma(n,\gamma)=0.162 \text{ mb } 22$ (85Ra15).
1237.61 5	(11416.94)	0.114 14				$\sigma(n,\gamma)=0.52 \text{ mb } 6$ (85Ra15).
1244.32 21	8874.02	0.026 6				$\sigma(n,\gamma)=0.120 \text{ mb } 26$ (85Ra15).
1247.92 6	5322.52	0.130 16	(E1)			$\sigma(n,\gamma)=0.59 \text{ mb } 7$ (85Ra15).
1266.11 5	5380.99	0.145 16				$\sigma(n,\gamma)=0.66 \text{ mb } 7$ (85Ra15).
1274.30 4	6954.22	0.257 25				$\sigma(n,\gamma)=1.17 \text{ mb } 11$ (85Ra15).
x1277.81 18		0.042 6				$\sigma(n,\gamma)=0.190 \text{ mb } 26$ (85Ra15).
1320.169 20	4624.410	8.4 9	E1 (+M2)	-0.02 4		$\sigma(n,\gamma)=38 \text{ mb } 4$ (85Ra15).
1325.22 26	(11416.94)	0.073 16				$\sigma(n,\gamma)=0.33 \text{ mb } 7$ (85Ra15).
1353.46 16	7781.22	0.084 11	(E1)			$\sigma(n,\gamma)=0.38 \text{ mb } 5$ (85Ra15).
1364.4 4	10092.21	0.070 20				$\sigma(n,\gamma)=0.32 \text{ mb } 9$ (85Ra15).
1374.34 20	6251.23	0.081 18	M1+E2	-3.7 +7-26		$\sigma(n,\gamma)=0.37 \text{ mb } 8$ (85Ra15).
x1435.00 11		0.066 11				$\sigma(n,\gamma)=0.30 \text{ mb } 5$ (85Ra15).
x1443.05 10		0.081 11				$\sigma(n,\gamma)=0.37 \text{ mb } 5$ (85Ra15).
1469.67 24	7467.74	0.051 9				$\sigma(n,\gamma)=0.23 \text{ mb } 4$ (85Ra15).
1479.73 15	6168.87	0.058 7	E1 (+M2)	+0.04 5		$\sigma(n,\gamma)=0.263 \text{ mb } 32$ (85Ra15).
1484.06 19	(11416.94)	0.073 11				$\sigma(n,\gamma)=0.33 \text{ mb } 5$ (85Ra15).
x1486.7 8		0.040 11				$\sigma(n,\gamma)=0.18 \text{ mb } 5$ (85Ra15).
1525.39 6	6847.90	0.249 25				$\sigma(n,\gamma)=1.13 \text{ mb } 11$ (85Ra15).
1544.41& 10	6168.87	0.57& 5	(E1)			$\sigma(n,\gamma)=2.58 \text{ mb } 24$ (85Ra15).
		6421.35	0.57& 5	E1 (+M2)	0.00 6	$\sigma(n,\gamma)=2.58 \text{ mb } 24$ (85Ra15).
1562.3 5	6251.23	0.18 5				$\sigma(n,\gamma)=0.80 \text{ mb } 20$ (85Ra15).
1564.8 5	5679.932	0.20 5	(E1)			$\sigma(n,\gamma)=0.91 \text{ mb } 20$ (85Ra15).
1572.57† 5	4876.846	1.23† 14	M1+E2	-0.09 4		$\sigma(n,\gamma)=5.6 \text{ mb } 6$ (85Ra15).
1580.50 6	(11416.94)	0.145 16				$\sigma(n,\gamma)=0.66 \text{ mb } 7$ (85Ra15).
1585.510 20	4889.758	0.55 5				$\sigma(n,\gamma)=2.52 \text{ mb } 23$ (85Ra15).
1602.06 15	6478.773	0.095 16				$\sigma(n,\gamma)=0.43 \text{ mb } 7$ (85Ra15).
1615.24 10	(11416.94)	0.50 6				$\sigma(n,\gamma)=2.25 \text{ mb } 27$ (85Ra15).
1617.00 12	8727.64	0.43 6				$\sigma(n,\gamma)=1.94 \text{ mb } 25$ (85Ra15).
1627.2 10	6251.68	0.042 16				$\sigma(n,\gamma)=0.19 \text{ mb } 7$ (85Ra15).
1631.641 25	6954.22	0.63 6				$\sigma(n,\gamma)=2.88 \text{ mb } 27$ (85Ra15).
1640.7 10	5755.882	0.037 22				$\sigma(n,\gamma)=0.17 \text{ mb } 10$ (85Ra15).
1732.39 11	6421.35	0.097 14	E1 (+M2)	0.0 2		$\sigma(n,\gamma)=0.44 \text{ mb } 6$ (85Ra15).
1739.32 9	6428.13	0.106 14				$\sigma(n,\gamma)=0.48 \text{ mb } 6$ (85Ra15).
1751.431 29	(11416.94)	0.32 3				$\sigma(n,\gamma)=1.44 \text{ mb } 14$ (85Ra15).
1772.82 4	5847.53	0.31 3	M1			$\sigma(n,\gamma)=1.40 \text{ mb } 14$ (85Ra15).
1788.794 20	3916.410	17.4 18				$\sigma(n,\gamma)=79 \text{ mb } 8$ (85Ra15).
1795.28& 30	8138.09	0.042& 11				$\sigma(n,\gamma)=0.19 \text{ mb } 5$ (85Ra15).
		9933.37	0.042& 11			$\sigma(n,\gamma)=0.19 \text{ mb } 5$ (85Ra15).
(1796.97)		6421.35	0.062 7			$\sigma(n,\gamma)=0.28 \text{ mb } 3$.
1818.96 14	(11416.94)	0.084 14				$\sigma(n,\gamma)=0.38 \text{ mb } 6$ (85Ra15).
1840.52† 12	9208.04	0.123† 20				$\sigma(n,\gamma)=0.56 \text{ mb } 9$ (85Ra15).
1854.28 4	6478.773	0.28 3				$\sigma(n,\gamma)=1.28 \text{ mb } 13$ (85Ra15).
1871.04 8	(11416.94)	0.45 5				$\sigma(n,\gamma)=2.04 \text{ mb } 22$ (85Ra15).
x1887.66 4		0.39 4				$\sigma(n,\gamma)=1.78 \text{ mb } 17$ (85Ra15).
1922.92 22	5998.10	0.134 25	(M1)			$\sigma(n,\gamma)=0.61 \text{ mb } 11$ (85Ra15).
1925.94 17	10311.54	0.062 18				$\sigma(n,\gamma)=0.28 \text{ mb } 8$ (85Ra15).
1947.060 20	4074.669	6.4 6	M1+E2	+1.3 +9-32		$\sigma(n,\gamma)=29.2 \text{ mb } 26$ (85Ra15).
1951.77 19	8294.40	0.117 25				$\sigma(n,\gamma)=0.53 \text{ mb } 11$ (85Ra15).
1959.67 17	9208.04	0.194 25				$\sigma(n,\gamma)=0.88 \text{ mb } 11$ (85Ra15).
x1980.15 12		0.141 20				$\sigma(n,\gamma)=0.64 \text{ mb } 9$ (85Ra15).
x1984.2 4		0.11 3				$\sigma(n,\gamma)=0.50 \text{ mb } 14$ (85Ra15).
1987.19 3	4114.815	1.43 16	M1+E2	-0.47 10		$\sigma(n,\gamma)=6.5 \text{ mb } 7$ (85Ra15).
1998.3 4	11024.95	0.031 11				$\sigma(n,\gamma)=0.14 \text{ mb } 5$ (85Ra15).
x2046.29 5		0.39 4				$\sigma(n,\gamma)=1.78 \text{ mb } 18$ (85Ra15).
2053.94 14	6168.87	0.130 20				$\sigma(n,\gamma)=0.59 \text{ mb } 9$ (85Ra15).
2076.89 8	5380.99	0.33 4				$\sigma(n,\gamma)=1.48 \text{ mb } 16$ (85Ra15).
2127.499 20	2127.566	70 7	E2			$\sigma(n,\gamma)=318 \text{ mb } 29$ (85Ra15).

Continued on next page (footnotes at end of table)

$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued) **$\gamma(^{34}\text{S})$ (continued)**

E γ	E(level)	I $^3\text{S}^{\pm}$ @	Mult.#	$\delta^{\#}$	I($\gamma+\text{ce}$)@	Comments
2152.41 23	9933.37	0.037 11				$\sigma(n,\gamma)=0.17 \text{ mb } 5$ (85Ra15).
2173.55 21	10311.54	0.035 11				$\sigma(n,\gamma)=0.16 \text{ mb } 5$ (85Ra15).
2209.10 6	(11416.94)	0.189 20				$\sigma(n,\gamma)=0.86 \text{ mb } 9$ (85Ra15).
2230.14 [†] 14	7552.70	0.176 [†] 22				$\sigma(n,\gamma)=0.80 \text{ mb } 10$ (85Ra15).
2233.49 4	7110.46	1.10 11	(E1)			$\sigma(n,\gamma)=5.0 \text{ mb } 5$ (85Ra15).
2258.430 23	(11416.94)	0.81 9				$\sigma(n,\gamma)=3.7 \text{ mb } 4$ (85Ra15).
x2282.17 4		0.37 4				$\sigma(n,\gamma)=1.70 \text{ mb } 16$ (85Ra15).
2290.26 15	8138.09	0.059 11				$\sigma(n,\gamma)=0.27 \text{ mb } 5$ (85Ra15).
2326.2& 10	8805.63	0.010& 10				$\sigma(n,\gamma)=0.05 \text{ mb } 4$ (85Ra15).
	9546.09	0.010& 10				$\sigma(n,\gamma)=0.05 \text{ mb } 4$ (85Ra15).
2328.8 5	7219.29	0.031 9	(E1)			$\sigma(n,\gamma)=0.14 \text{ mb } 4$ (85Ra15).
2353.06 21	6428.13	0.051 9				$\sigma(n,\gamma)=0.23 \text{ mb } 4$ (85Ra15).
2363.97 8	8615.74	0.46 25				$\sigma(n,\gamma)=2.1 \text{ mb } 11$ (85Ra15).
(2371.12)	7248.05	0.0198				$\sigma(n,\gamma)=0.09 \text{ mb}$.
2375.657 20	5679.932	5.7 6	(E1)			$\sigma(n,\gamma)=26.0 \text{ mb } 24$ (85Ra15).
2390.82 6	(11416.94)	0.29 3				$\sigma(n,\gamma)=1.33 \text{ mb } 14$ (85Ra15).
2404.04 6	6478.773	0.235 25				$\sigma(n,\gamma)=1.07 \text{ mb } 11$ (85Ra15).
x2441.31 4		0.39 4				$\sigma(n,\gamma)=1.75 \text{ mb } 17$ (85Ra15).
2451.557 20	5755.882	1.14 11				$\sigma(n,\gamma)=5.2 \text{ mb } 5$ (85Ra15).
x2475.15 4		0.38 4				$\sigma(n,\gamma)=1.71 \text{ mb } 17$ (85Ra15).
2490.6 [‡] 13	7367.43	0.14 [‡] 4				$\sigma(n,\gamma)=0.62 \text{ mb } 16$ (85Ra15).
2496.726 20	4624.410	3.4 3	E1 (+M2)	+0.02 4		$\sigma(n,\gamma)=15.4 \text{ mb } 14$ (85Ra15).
2530.25 10	7219.29	0.112 16				$\sigma(n,\gamma)=0.51 \text{ mb } 7$ (85Ra15).
2543.13& 10	5847.53	2.1& 2	E2			$\sigma(n,\gamma)=9.6 \text{ mb } 9$ (85Ra15).
	(11416.94)	2.1& 2				$\sigma(n,\gamma)=9.6 \text{ mb } 9$ (85Ra15).
2558.82 13	7248.05	0.27 3				$\sigma(n,\gamma)=1.24 \text{ mb } 14$ (85Ra15).
2561.36 5	4688.98	0.79 9	E2 (+M3)	0.00 1		$\sigma(n,\gamma)=3.6 \text{ mb } 4$ (85Ra15).
2611.7 4	(11416.94)	0.26 7				$\sigma(n,\gamma)=1.2 \text{ mb } 3$ (85Ra15).
(2623.54)	7248.05	0.0242				$\sigma(n,\gamma)=0.11 \text{ mb}$.
2689.50 10	(11416.94)	0.48 6				$\sigma(n,\gamma)=2.16 \text{ mb } 24$ (85Ra15).
2714.50 19	(11416.94)	0.62 11				$\sigma(n,\gamma)=2.8 \text{ mb } 5$ (85Ra15).
2749.24 5	4876.846	1.54 16	M1+E2	-0.11 3		$\sigma(n,\gamma)=7.0 \text{ mb } 7$ (85Ra15).
2753.3 [‡] 13	6828.83	0.20 [‡] 5				$\sigma(n,\gamma)=0.93 \text{ mb } 23$ (85Ra15).
2762.10 8	4889.758	0.66 7				$\sigma(n,\gamma)=3.0 \text{ mb } 3$ (85Ra15).
2801.33 5	(11416.94)	2.22 22				$\sigma(n,\gamma)=10.1 \text{ mb } 10$ (85Ra15).
x2810.3 3		0.19 3				$\sigma(n,\gamma)=0.87 \text{ mb } 13$ (85Ra15).
2817.76& 25	6121.56	0.19& 3	M1+E2	-0.09 4		$\sigma(n,\gamma)=0.84 \text{ mb } 13$ (85Ra15).
	9665.75	0.19& 3				$\sigma(n,\gamma)=0.84 \text{ mb } 13$ (85Ra15).
2839.3 4	6954.22	0.22 4				$\sigma(n,\gamma)=1.00 \text{ mb } 16$ (85Ra15).
2843.7 6	10311.54	0.13 3				$\sigma(n,\gamma)=0.59 \text{ mb } 13$ (85Ra15).
2864.56 4	6168.87	2.40 25	E1+M2	-0.23 7		$\sigma(n,\gamma)=10.9 \text{ mb } 11$ (85Ra15).
2910.28 5	(11416.94)	2.20 22				$\sigma(n,\gamma)=10.0 \text{ mb } 10$ (85Ra15).
2919.7 5	10650.13	0.095 25				$\sigma(n,\gamma)=0.43 \text{ mb } 11$ (85Ra15).
2940.42 31	7629.912	0.23 4	(E1)			$\sigma(n,\gamma)=1.05 \text{ mb } 15$ (85Ra15).
2945.8& 10	8174.9	0.066& 20				$\sigma(n,\gamma)=0.30 \text{ mb } 9$ (85Ra15).
	8702.35	0.066& 20				$\sigma(n,\gamma)=0.30 \text{ mb } 9$ (85Ra15).
2989.9 7	9836.70	0.040 20				$\sigma(n,\gamma)=0.18 \text{ mb } 9$ (85Ra15).
2995.8 6	7110.46	0.081 22	(E1)			$\sigma(n,\gamma)=0.37 \text{ mb } 10$ (85Ra15).
3005.39 5	7629.912	2.20 22				$\sigma(n,\gamma)=10.0 \text{ mb } 10$ (85Ra15).
3022.0 10	8702.35	0.035 20				$\sigma(n,\gamma)=0.16 \text{ mb } 9$ (85Ra15).
3031.69 8	(11416.94)	1.01 14				$\sigma(n,\gamma)=4.6 \text{ mb } 6$ (85Ra15).
3038.18 32	6342.53	0.28 4				$\sigma(n,\gamma)=1.27 \text{ mb } 17$ (85Ra15).
x3051.83 26		0.14 3				$\sigma(n,\gamma)=0.64 \text{ mb } 12$ (85Ra15).
3089.53 26	7164.47	0.123 25				$\sigma(n,\gamma)=0.56 \text{ mb } 11$ (85Ra15).
3122.65 15	(11416.94)	0.59 9				$\sigma(n,\gamma)=2.7 \text{ mb } 4$ (85Ra15).
x3149.29 15		0.20 3				$\sigma(n,\gamma)=0.89 \text{ mb } 12$ (85Ra15).
3174.37 5	6478.773	2.31 22				$\sigma(n,\gamma)=10.5 \text{ mb } 10$ (85Ra15).
3183.9 [†] 7	8506.78	0.026 [†] 18				$\sigma(n,\gamma)=0.12 \text{ mb } 8$ (85Ra15).
3194.74 5	5322.52	1.63 18	E1+M2	-0.17 6		$\sigma(n,\gamma)=7.4 \text{ mb } 8$ (85Ra15).
3211.69 9	(11416.94)	0.52 5				$\sigma(n,\gamma)=2.36 \text{ mb } 23$ (85Ra15).
3231.89 20	(11416.94)	0.185 25				$\sigma(n,\gamma)=0.84 \text{ mb } 11$ (85Ra15).
3241.9 5	(11416.94)	0.079 16				$\sigma(n,\gamma)=0.36 \text{ mb } 7$ (85Ra15).
3253.21 6	5380.99	0.84 9				$\sigma(n,\gamma)=3.8 \text{ mb } 4$ (85Ra15).

Continued on next page (footnotes at end of table)

$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued) **$\gamma(^{34}\text{S})$ (continued)**

E γ	E(level)	I $^3\text{S}^{\pm}$ @	Mult.#	$\delta^{\#}$	I($\gamma+\text{ce}$)@	Comments
3278.79 11	(11416.94)	0.70 9				$\sigma(n,\gamma)=3.2 \text{ mb } 4$ (85Ra15).
3304.031 20	3304.216	13.9 14	E2			$\sigma(n,\gamma)=63 \text{ mb } 6$ (85Ra15).
3311.6 5	9158.72	0.136 25				$\sigma(n,\gamma)=0.62 \text{ mb } 11$ (85Ra15).
3392.86 24	7467.74	0.35 5				$\sigma(n,\gamma)=1.57 \text{ mb } 19$ (85Ra15).
3442.24 25	(11416.94)	0.22 4				$\sigma(n,\gamma)=1.02 \text{ mb } 16$ (85Ra15).
3451.5 9	7367.43	0.077 22				$\sigma(n,\gamma)=0.35 \text{ mb } 10$ (85Ra15).
3476.95 18	9598.42	0.156 22				$\sigma(n,\gamma)=0.71 \text{ mb } 10$ (85Ra15).
3500.3 5	8727.64	0.106 25				$\sigma(n,\gamma)=0.48 \text{ mb } 11$ (85Ra15).
3515.07 11	7629.912	0.31 4	(E1)			$\sigma(n,\gamma)=1.43 \text{ mb } 16$ (85Ra15).
3552.08 4	5679.932	3.81 4				$\sigma(n,\gamma)=17.34 \text{ mb } 17$ (85Ra15).
3581.2 4	8205.41	0.081 16				$\sigma(n,\gamma)=0.37 \text{ mb } 7$ (85Ra15).
3628.10 4	5755.882	3.9 4				$\sigma(n,\gamma)=17.6 \text{ mb } 16$ (85Ra15).
3635.83 8	(11416.94)	1.14 14				$\sigma(n,\gamma)=5.2 \text{ mb } 6$ (85Ra15).
3644.8 8	9026.31	0.106 22				$\sigma(n,\gamma)=0.48 \text{ mb } 10$ (85Ra15).
3649.88 12	6954.22	0.68 7				$\sigma(n,\gamma)=3.11 \text{ mb } 31$ (85Ra15).
3664.8 4	10092.21	0.103 22				$\sigma(n,\gamma)=0.47 \text{ mb } 10$ (85Ra15).
3719.68 16	5847.53	0.42 5	E2			$\sigma(n,\gamma)=1.91 \text{ mb } 20$ (85Ra15).
3738.69 17	8615.74	0.26 4				$\sigma(n,\gamma)=1.18 \text{ mb } 17$ (85Ra15).
3787.096 20	(11416.94)	5.8 6				$\sigma(n,\gamma)=26.5 \text{ mb } 25$ (85Ra15).
3812.0 5	8702.35	0.055 14				$\sigma(n,\gamma)=0.25 \text{ mb } 6$ (85Ra15).
3864.25 11	(11416.94)	0.37 4				$\sigma(n,\gamma)=1.68 \text{ mb } 17$ 985ra15).
3870.51 31	5998.10	0.123 18				$\sigma(n,\gamma)=0.56 \text{ mb } 8$ (85Ra15).
(3916.17)	3916.410		E0		0.0066 11	$\sigma(n,\gamma)=0.030 \text{ mb } 5$.
3949.27 12	(11416.94)	0.34 4				$\sigma(n,\gamma)=1.54 \text{ mb } 17$ (85Ra15).
3990.7 7	8615.74	0.064 16				$\sigma(n,\gamma)=0.29 \text{ mb } 7$ (85Ra15).
3994.8 8	6121.56	0.055 16				$\sigma(n,\gamma)=0.25 \text{ mb } 7$ (85Ra15).
4040.63 29	6168.87	0.119 18	E1+M2	-0.43 16		$\sigma(n,\gamma)=0.54 \text{ mb } 8$ (85Ra15).
4049.68 15	(11416.94)	0.26 3				$\sigma(n,\gamma)=1.17 \text{ mb } 13$ (85Ra15).
4074.418 20	4074.669	6.9 7	M1			$\sigma(n,\gamma)=31.3 \text{ mb } 29$ (85Ra15).
4114.52 4	4114.815	1.89 20	E2			$\sigma(n,\gamma)=8.6 \text{ mb } 9$ (85Ra15).
4197.69 9	(11416.94)	0.66 9				$\sigma(n,\gamma)=3.0 \text{ mb } 4$ (85Ra15).
4248.28 21	7552.70	0.35 4				$\sigma(n,\gamma)=1.59 \text{ mb } 18$ (85Ra15).
4252.38 22	(11416.94)	0.27 4				$\sigma(n,\gamma)=1.23 \text{ mb } 15$ (85Ra15).
4306.44 6	(11416.94)	1.83 18				$\sigma(n,\gamma)=8.3 \text{ mb } 8$ (85Ra15).
4325.397 30	7629.912	2.8 3	(E1)			$\sigma(n,\gamma)=12.7 \text{ mb } 12$ (85Ra15).
4350.85 9	6478.773	1.36 16				$\sigma(n,\gamma)=6.2 \text{ mb } 7$ (85Ra15).
4391.77 29	8506.78	0.097 20	(E1)			$\sigma(n,\gamma)=0.44 \text{ mb } 9$ (85Ra15).
(4426.27)	7730.80					
4462.44 20	(11416.94)	1.74 18				$\sigma(n,\gamma)=7.9 \text{ mb } 8$ (85Ra15).
4499.7 10	10179.60	0.051 16				$\sigma(n,\gamma)=0.23 \text{ mb } 7$ (85Ra15).
4532.6 7	10212.16	0.051 16				$\sigma(n,\gamma)=0.23 \text{ mb } 7$ (85Ra15).
4540.68 15	8615.74	0.37 5				$\sigma(n,\gamma)=1.70 \text{ mb } 20$ (85Ra15).
4568.9 4	(11416.94)	0.066 14				$\sigma(n,\gamma)=0.30 \text{ mb } 6$ (85Ra15).
4588.37 26	(11416.94)	0.130 22				$\sigma(n,\gamma)=0.59 \text{ mb } 10$ (85Ra15).
4624.2 5	4624.410	0.046 11	E3			$\sigma(n,\gamma)=0.21 \text{ mb } 5$ (85Ra15).
4670.1 6	7974.72	0.024 14				$\sigma(n,\gamma)=0.11 \text{ mb } 6$ (85Ra15).
4731.37 10	(11416.94)	0.35 4				$\sigma(n,\gamma)=1.58 \text{ mb } 10$ (85Ra15).
4758.79 27	8874.02	0.101 18				$\sigma(n,\gamma)=0.46 \text{ mb } 8$ (85Ra15).
4799.11 28	8874.02	0.114 18				$\sigma(n,\gamma)=0.52 \text{ mb } 8$ (85Ra15).
4826.0 5	6954.22	0.024 11				$\sigma(n,\gamma)=0.11 \text{ mb } 5$ (85Ra15).
4889.30 8	4889.758	0.59 6	E2			$\sigma(n,\gamma)=2.68 \text{ mb } 26$ (85Ra15).
4903.4 [†] 5	11024.95	0.062 [†] 18				$\sigma(n,\gamma)=0.28 \text{ mb } 8$ (85Ra15).
4938.06 3	(11416.94)	4.9 5				$\sigma(n,\gamma)=22.2 \text{ mb } 21$ (85Ra15).
4982.44 20	7110.46	0.29 3	E1+M2	+0.27 17		$\sigma(n,\gamma)=1.31 \text{ mb } 14$ (85Ra15).
4988.6 4	10311.54	0.139 20				$\sigma(n,\gamma)=0.63 \text{ mb } 9$ (85Ra15).
5036.4 7	7164.47	0.055 14				$\sigma(n,\gamma)=0.25 \text{ mb } 6$ (85Ra15).
5043.3 4	9158.72	0.35 6				$\sigma(n,\gamma)=1.59 \text{ mb } 26$ (85Ra15).
5074.79 25	(11416.94)	0.092 18				$\sigma(n,\gamma)=0.42 \text{ mb } 8$ (85Ra15).
5084.2 5	9158.72	0.031 11				$\sigma(n,\gamma)=0.14 \text{ mb } 5$ (85Ra15).
(5120.07)	7248.05	0.0792				$\sigma(n,\gamma)=0.36 \text{ mb}$.
5202.06 6	8506.78	0.66 7	(E1)			$\sigma(n,\gamma)=3.00 \text{ mb } 29$ (85Ra15).
5239.8 4	7367.43	0.143 20				$\sigma(n,\gamma)=0.65 \text{ mb } 9$ (85Ra15).
5247.94 4	(11416.94)	2.60 25				$\sigma(n,\gamma)=11.8 \text{ mb } 11$ (85Ra15).

Continued on next page (footnotes at end of table)

$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued) **$\gamma(^{34}\text{S})$ (continued)**

E γ	E(level)	I $^3\text{S}^{\pm}$	Mult. [#]	Comments
5268.9 & 6	10650.13	0.059 & 15		$\sigma(n,\gamma)=0.27 \text{ mb } 7$ (85Ra15).
	11024.95	0.059 & 15		$\sigma(n,\gamma)=0.27 \text{ mb } 7$ (85Ra15).
5294.94 24	(11416.94)	0.092 18		$\sigma(n,\gamma)=0.42 \text{ mb } 8$ (85Ra15).
5311.10 15	8615.74	0.176 22		$\sigma(n,\gamma)=0.80 \text{ mb } 10$ (85Ra15).
5380.59 9	5380.99	0.43 5	M1	$\sigma(n,\gamma)=1.97 \text{ mb } 20$ (85Ra15).
5501.4 5	8805.63	0.101 20		$\sigma(n,\gamma)=0.46 \text{ mb } 9$ (85Ra15).
5569.30 5	(11416.94)	1.23 14		$\sigma(n,\gamma)=5.6 \text{ mb } 6$ (85Ra15).
5602.78 15	7730.80	0.25 3		$\sigma(n,\gamma)=1.15 \text{ mb } 14$ (85Ra15).
5660.78 6	(11416.94)	4.0 4		$\sigma(n,\gamma)=18.4 \text{ mb } 18$ (85Ra15).
5736.76 4	(11416.94)	9.5 9		$\sigma(n,\gamma)=43 \text{ mb } 4$ (85Ra15).
5755.5 5	5755.882	0.112 18	E1	$\sigma(n,\gamma)=0.51 \text{ mb } 8$ (85Ra15).
5847.4 5	7974.72	0.055 14		$\sigma(n,\gamma)=0.25 \text{ mb } 6$ (85Ra15).
5884.6 6	9801.89	0.059 14		$\sigma(n,\gamma)=0.27 \text{ mb } 6$ (85Ra15).
5997.30 31	5998.10	0.075 14	E2	$\sigma(n,\gamma)=0.34 \text{ mb } 6$ (85Ra15).
6010.3 3	8138.09	0.110 18		$\sigma(n,\gamma)=0.50 \text{ mb } 8$ (85Ra15).
6035.68 7	(11416.94)	0.97 11		$\sigma(n,\gamma)=4.4 \text{ mb } 5$ (85Ra15).
(6057.31)	8185.46			
6077.27 12	8205.41	0.26 3		$\sigma(n,\gamma)=1.19 \text{ mb } 13$ (85Ra15).
6094.4 4	(11416.94)	0.046 11		$\sigma(n,\gamma)=0.21 \text{ mb } 5$ (85Ra15).
6152.1 5	10840.62	0.040 11		$\sigma(n,\gamma)=0.18 \text{ mb } 5$ (85Ra15).
6166.24 13	8294.40	0.34 4		$\sigma(n,\gamma)=1.55 \text{ mb } 17$ (85Ra15).
6188.45 6	(11416.94)	1.91 20		$\sigma(n,\gamma)=8.7 \text{ mb } 9$ (85Ra15).
6236.3 11	10311.54	0.042 11		$\sigma(n,\gamma)=0.19 \text{ mb } 5$ (85Ra15).
6241.0 5	9546.09	0.099 16		$\sigma(n,\gamma)=0.45 \text{ mb } 7$ (85Ra15).
6341.58 32	6342.53	0.099 18	E1	$\sigma(n,\gamma)=0.45 \text{ mb } 8$ (85Ra15).
6487.48 6	8615.74	0.79 9		$\sigma(n,\gamma)=3.6 \text{ mb } 4$ (85Ra15).
6496.62 23	9801.89	0.123 16		$\sigma(n,\gamma)=0.56 \text{ mb } 7$ (85Ra15).
6526.84 6	(11416.94)	1.21 14		$\sigma(n,\gamma)=5.5 \text{ mb } 6$ (85Ra15).
6539.66 16	(11416.94)	0.22 3		$\sigma(n,\gamma)=0.99 \text{ mb } 12$ (85Ra15).
6573.6 4	8702.35	0.24 5		$\sigma(n,\gamma)=1.09 \text{ mb } 19$ (85Ra15).
6600.1 7	8727.64	0.051 11		$\sigma(n,\gamma)=0.23 \text{ mb } 5$ (85Ra15).
6727.5 9	(11416.94)	0.015 9		$\sigma(n,\gamma)=0.07 \text{ mb } 4$ (85Ra15).
6745.64 16	8874.02	0.60 7		$\sigma(n,\gamma)=2.71 \text{ mb } 30$ (85Ra15).
6792.10 3	(11416.94)	5.3 5		$\sigma(n,\gamma)=24.2 \text{ mb } 23$ (85Ra15).
(6828)	6828.83		E2	
6846.37 32	6847.90	0.123 16		$\sigma(n,\gamma)=0.56 \text{ mb } 7$ (85Ra15).
7218.48 13	7219.29	0.60 7		$\sigma(n,\gamma)=2.71 \text{ mb } 28$ (85Ra15).
7302.2 8	(11416.94)	0.062 11		$\sigma(n,\gamma)=0.28 \text{ mb } 5$ (85Ra15).
7341.67 6	(11416.94)	8.0 7		$\sigma(n,\gamma)=36.5 \text{ mb } 34$ (85Ra15).
7499.90 5	(11416.94)	13.6 14		$\sigma(n,\gamma)=62 \text{ mb } 6$ (85Ra15).
7536.2 7	9665.75	0.097 22		$\sigma(n,\gamma)=0.44 \text{ mb } 10$ (85Ra15).
7675.0 8	9801.89	0.035 9		$\sigma(n,\gamma)=0.16 \text{ mb } 4$ (85Ra15).
7708.32 30	9836.70	0.097 16		$\sigma(n,\gamma)=0.44 \text{ mb } 7$ (85Ra15).
7780.22 10	7781.22	0.84 11	E1	$\sigma(n,\gamma)=3.8 \text{ mb } 5$ (85Ra15).
7973.45 25	7974.72	0.092 14		$\sigma(n,\gamma)=0.42 \text{ mb } 6$ (85Ra15).
8036.6 7	8036.31	0.040 9		$\sigma(n,\gamma)=0.18 \text{ mb } 4$ (85Ra15).
8051.1 6	10179.60	0.057 11		$\sigma(n,\gamma)=0.26 \text{ mb } 5$ (85Ra15).
8083.49 31	10212.16	0.103 16		$\sigma(n,\gamma)=0.47 \text{ mb } 7$ (85Ra15).
8111.99 9	(11416.94)	1.34 16		$\sigma(n,\gamma)=6.1 \text{ mb } 7$ (85Ra15).
8136.98 17	8138.09	0.31 4	E1	$\sigma(n,\gamma)=1.40 \text{ mb } 16$ (85Ra15).
8173.8 9	8174.9	0.035 7		$\sigma(n,\gamma)=0.157 \text{ mb } 31$ (85Ra15).
8184.70 24	8185.46	0.141 16		$\sigma(n,\gamma)=0.64 \text{ mb } 7$ (85Ra15).
8384.28 9	8385.41	0.75 8	E1	$\sigma(n,\gamma)=3.43 \text{ mb } 33$ (85Ra15).
8505.68 10	8506.78	1.03 11	E1	$\sigma(n,\gamma)=4.7 \text{ mb } 5$ (85Ra15).
8726.78 24	8727.64	0.097 14		$\sigma(n,\gamma)=0.44 \text{ mb } 6$ (85Ra15).
8804.4 4	8805.63	0.053 9		$\sigma(n,\gamma)=0.24 \text{ mb } 4$ (85Ra15).
9024.95 17	9026.31	0.176 20		$\sigma(n,\gamma)=0.80 \text{ mb } 9$ (85Ra15).
9206.65 26	9208.04	0.077 11		$\sigma(n,\gamma)=0.35 \text{ mb } 5$ (85Ra15).
9288.28 16	(11416.94)	0.24 3		$\sigma(n,\gamma)=1.10 \text{ mb } 12$ (85Ra15).
9544.83 28	9546.09	0.084 11		$\sigma(n,\gamma)=0.38 \text{ mb } 5$ (85Ra15).
9932.1 6	9933.37	0.018 5	E1	$\sigma(n,\gamma)=0.082 \text{ mb } 19$ (85Ra15).
11415.17 11	(11416.94)	1.56 16		$\sigma(n,\gamma)=7.1 \text{ mb } 7$ (85Ra15).

Footnotes continued on next page

 $^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued)

 $\gamma(^{34}\text{S})$ (continued)

† After corrections due to a γ -ray of similar energy in $^{34}\text{S}(\text{n},\gamma)^{35}\text{S}$ reaction.

‡ After corrections due to a γ -ray of similar energy in $^{32}\text{S}(\text{n},\gamma)^{33}\text{S}$ reaction.

§ Absolute intensities per 100 neutron captures. For γ -ray cross section in mb (85Ra15), multiply by 4.54545 per 100 neutron captures. From the difference between the intensities feeding the ground state and emerging from the capturing state, it is noted that \approx 75 mb of intensity (17% of the total capture cross section) is contained in numerous unobserved (and fewer unplaced or misplaced) primary transitions. Whenever either the intensity in or intensity out exceeds 10 mb, the intensity balance is satisfactory (<20% imbalance) for all levels, except the 4115-keV, 2⁺ state. This agreement is not contrived but emerges naturally from a skeleton level scheme eschewing the weaker transitions.

From adopted gammas, except as noted.

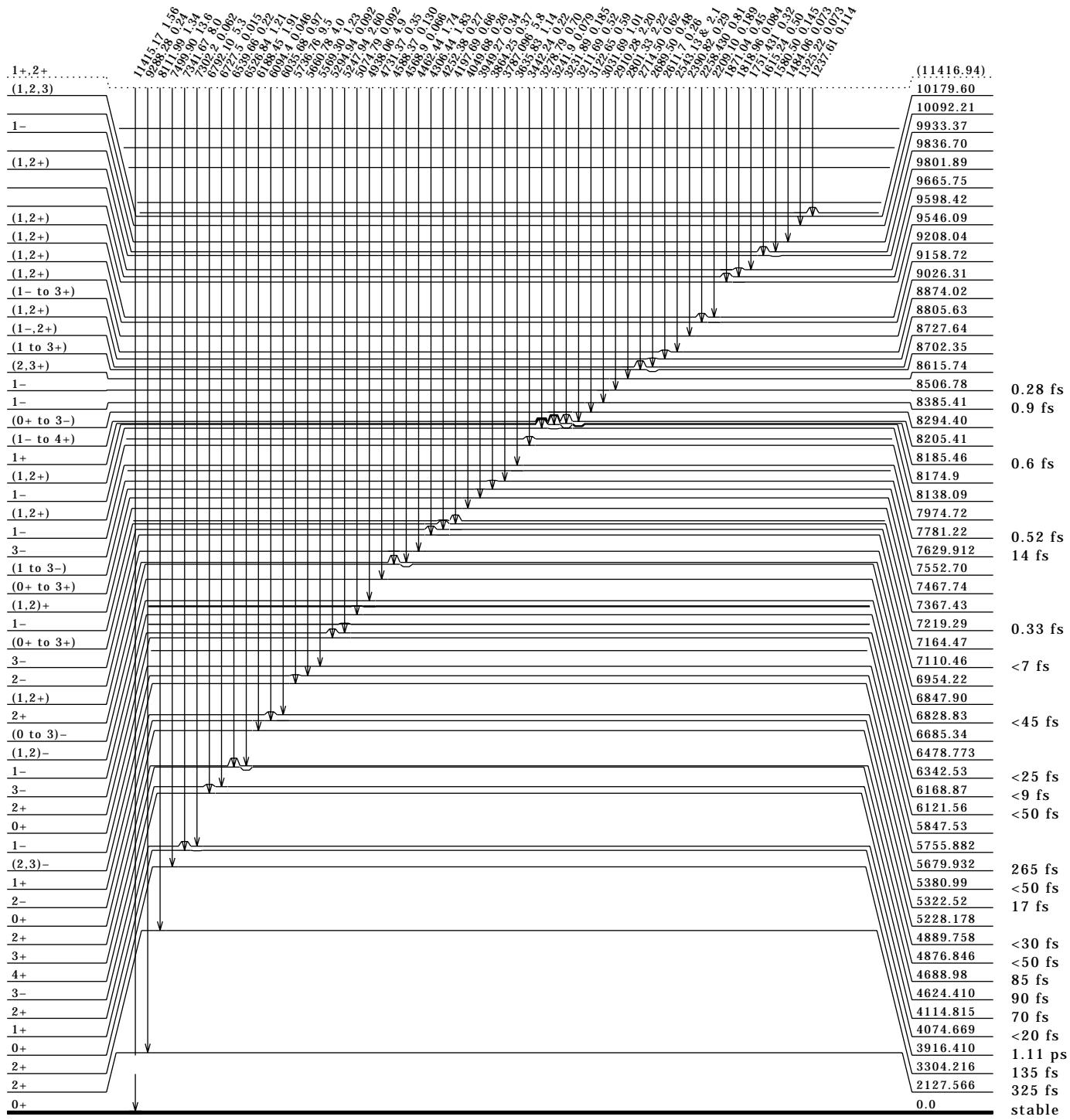
@ For intensity per 100 neutron captures, multiply by 1.

& Multiply placed; undivided intensity given.

^x γ ray not placed in level scheme.

$^{33}\text{S}(n,\gamma)$ E=thermal 85Ra15 (continued)**Level Scheme**

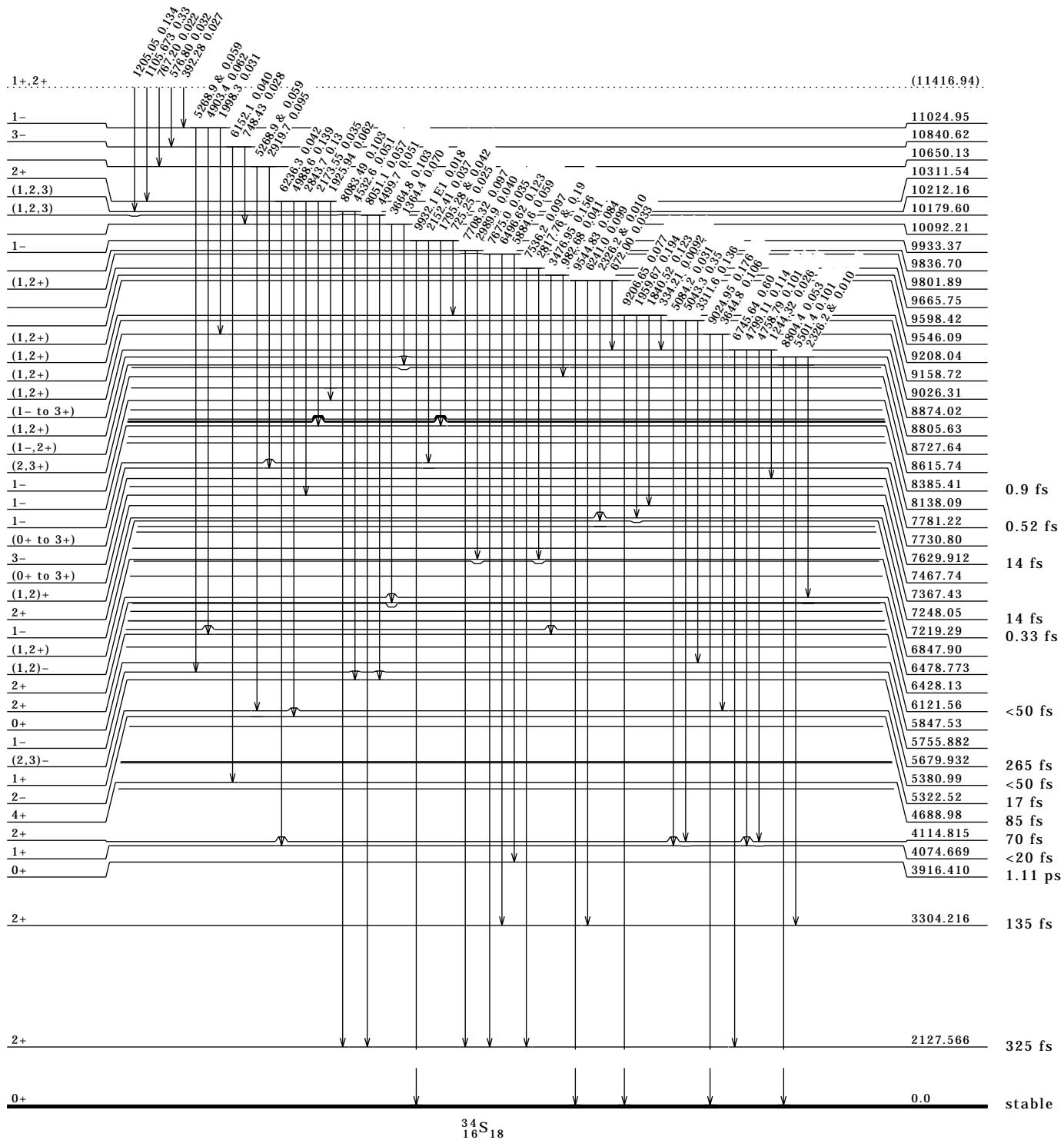
Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued)

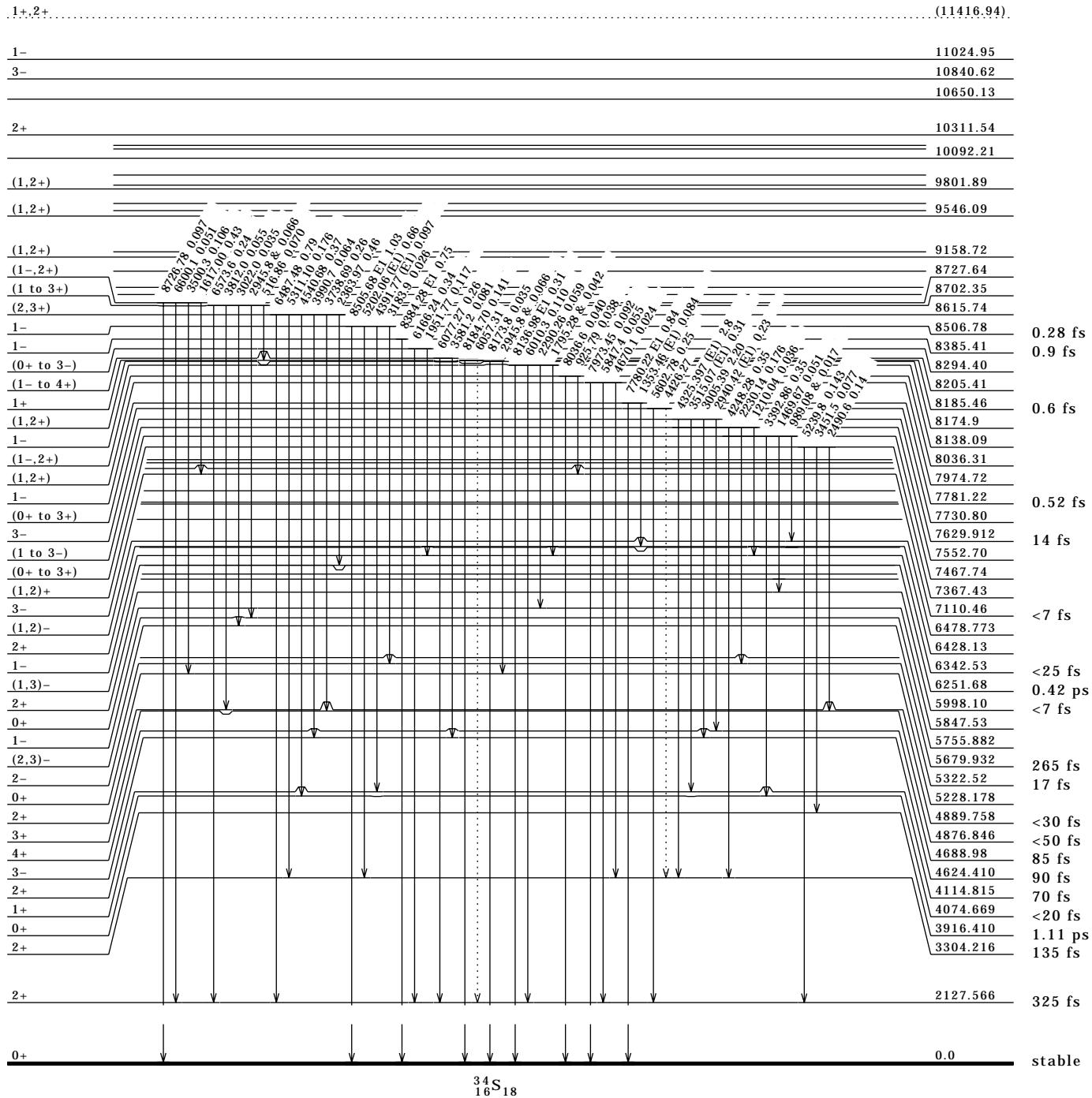
Level Scheme (continued)

Intensities: $I(\gamma+\text{ce})$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued)**Level Scheme (continued)**

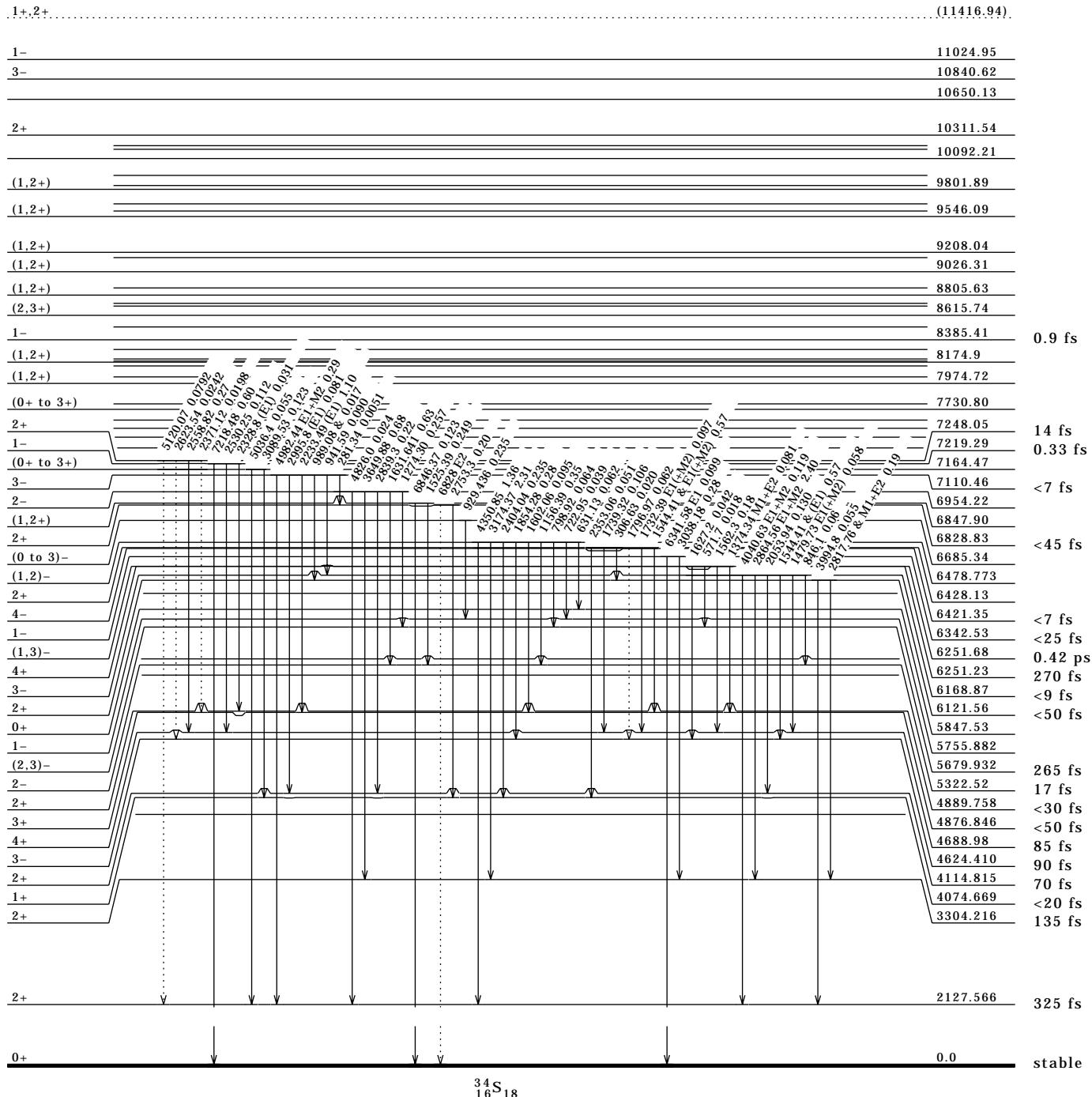
Intensities: $I(\gamma+\text{ce})$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{33}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15 (continued)

Level Scheme (continued)

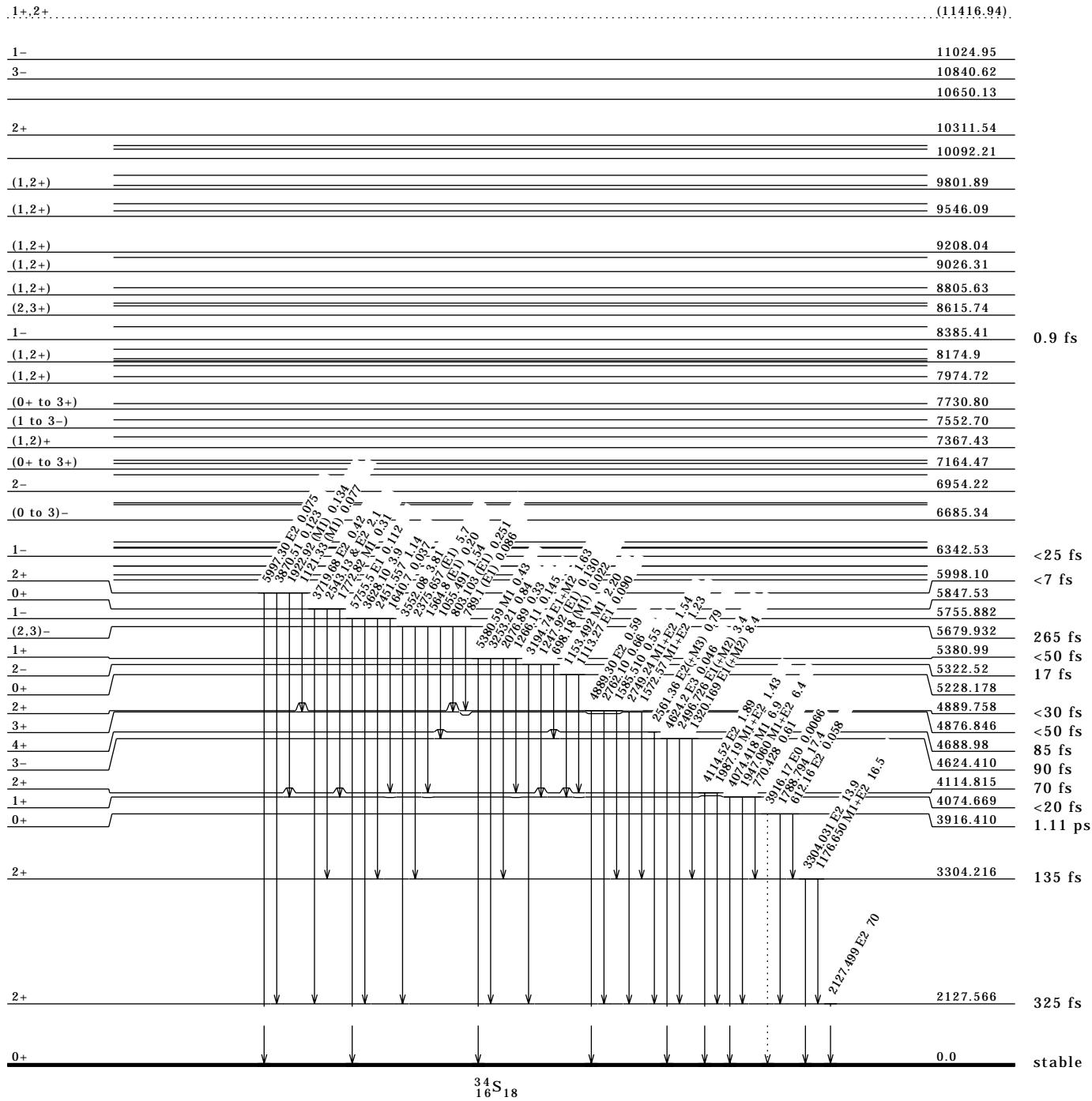
Intensities: $I(\gamma+\text{ce})$ per 100 parent decays
 & Multiply placed; undivided intensity given



³³S(n, γ) E=thermal 85Ra15 (continued)

Level Scheme (continued)

Intensities: $I(\gamma + ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{34}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15,85Ke08Target $J\pi=0^+$.85Ra15: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl) in Compton-suppressed mode and pair spectrometer mode. Deduced neutron separation energy $S(n)=6986.089$ keV 14.85Ke08: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl). Deduced neutron separation energy $S(n)=6985.84$ keV 5.Other measured $S(n)=6986.089$ keV 44 (83Ra04).Evaluated $S(n)=6985.84$ keV 4 (95Au04).Measured thermal-neutron capture cross section, $\sigma(n,\gamma)=518$ mb 14 (85Ra15). **^{35}S Levels**

E(level) [‡]	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0.0	$3/2^+$	87.51 d 12	% β^- =100.
1572.373 6	$1/2^+$	2.3 ps 3	
1991.28 5	$7/2^+$	1.02 ns 5	
2347.781 7	$3/2^-$	0.89 ps 12	
2716.991 20	$5/2^+$	70 fs 25	
2938.64 5	$3/2^+$		
3558.074 24	($3/2^-$, $5/2$)		
3801.955 14	$3/2^-$	25 fs 18	
4105.6 7	($1/2$, $3/2$, $5/2$) ⁺		
4189.256 15	$1/2^-$	<55 fs	
4477.60 7	($1/2$, $3/2$, $5/2$) ⁺		
4903.355 13	$1/2^-$		
4963.073 15	$3/2^-$		
5752.5 8	($1/2$ to $7/2$) ⁺		
6018.8 6	($1/2$ to $5/2$) ⁺		
6078.471 20	($1/2$, $3/2$) ⁻		
6293.92 6	($1/2$ to $5/2$) ⁺		
6354.88 23	($1/2$ to $5/2$) ⁺		
6419.9 11			
6629.42 9	($1/2$ to $5/2$) ⁺		
6761.0 12			
(6985.84 4)	$1/2^+$		E(level): from evaluated $S(n)$ (95Au04). $J\pi$: from s-wave neutron capture. Observed deexcitation intensity is 45.7% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From $E\gamma$'s using least-squares fit to data, except as noted. **$\gamma(^{35}\text{S})$**

All data are from 85Ra15, except as noted.

 $I\gamma$ normalization: renormalized from assuming $I\gamma$ (to g.s.)=100.

$E\gamma$	E(level)	$I\gamma\$@$	Mult.#	$\delta^{\#}$	Comments
356.66& 9	2347.781 (6985.84)	0.037& 4 0.037& 4			$\sigma(n,\gamma)=0.110$ mb 12 (85Ra15). $\sigma(n,\gamma)=0.110$ mb 12 (85Ra15).
368.5 4	2716.991	0.020 7			$\sigma(n,\gamma)=0.06$ mb 2 (85Ra15).
619.23 19	3558.074	0.041 8			$\sigma(n,\gamma)=0.122$ mb 22 (85Ra15).
631.32& 24	4189.256 (6985.84)	0.060& 9 0.060& 9			$\sigma(n,\gamma)=0.175$ mb 25 (85Ra15). $\sigma(n,\gamma)=0.175$ mb 25 (85Ra15).
x663.41 7		0.090 11			$\sigma(n,\gamma)=0.266$ mb 30 (85Ra15).
692.16 5	(6985.84)	0.132 17			$\sigma(n,\gamma)=0.39$ mb 5 (85Ra15).
775.398 6	2347.781	15.6 17	(E1)		$\sigma(n,\gamma)=46$ mb 5 (85Ra15).
x803.81 9		0.092 14			$\sigma(n,\gamma)=0.27$ mb 4 (85Ra15).
863.28 28	3801.955	0.034 11	(E1)		$\sigma(n,\gamma)=0.10$ mb 3 (85Ra15).
907.607 [†] 14	(6985.84)	0.61 [†] 11			$\sigma(n,\gamma)=1.79$ mb 30 (85Ra15).
1084.79 15	3801.955	0.054 11	(E1)		$\sigma(n,\gamma)=0.16$ mb 3 (85Ra15).
1101.92 31	4903.355	0.033 8			$\sigma(n,\gamma)=0.096$ mb 23 (85Ra15).
1144.591 20	2716.991	0.55 6			$\sigma(n,\gamma)=1.63$ mb 16 (85Ra15).
1161.05 20	4963.073	0.055 9			$\sigma(n,\gamma)=0.161$ mb 24 (85Ra15).
(1166.9)	4105.6	0.0068			$\sigma(n,\gamma)=0.02$ mb.
1210.28 4	3558.074	0.25 3			$\sigma(n,\gamma)=0.74$ mb 8 (85Ra15).
1250.61 5	4189.256	0.214 24	(E1)		$\sigma(n,\gamma)=0.63$ mb 7 (85Ra15).
x1381.67 24		0.024 9			$\sigma(n,\gamma)=0.070$ mb 24 (85Ra15).

Continued on next page (footnotes at end of table)

$^{34}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15,85Ke08 (continued) **$\gamma^{(35)\text{S}}$ (continued)**

E_{γ}	E(level)	I_{γ} §@	Mult.#	$\delta^{\#}$	Comments
1404.967 24	4963.073	0.60 6			$\sigma(n,\gamma)=1.76 \text{ mb } 17$ (85Ra15).
1454.09† 4	3801.955	0.45† 11			$\sigma(n,\gamma)=1.33 \text{ mb } 32$ (85Ra15).
1566.7 3	3558.074	0.47 9			$\sigma(n,\gamma)=1.38 \text{ mb } 25$ (85Ra15).
1572.333 7	1572.373	35 4			$\sigma(n,\gamma)=103 \text{ mb } 10$ (85Ra15).
1760.55 11	4477.60	0.146 21			$\sigma(n,\gamma)=0.43 \text{ mb } 6$ (85Ra15).
1841.426 15	4189.256	2.14 21			$\sigma(n,\gamma)=6.3 \text{ mb } 6$ (85Ra15).
1964.8† 2	4903.355	0.37† 11			$\sigma(n,\gamma)=1.1 \text{ mb } 3$ (85Ra15).
1991.27 5	1991.28	0.54 6	M2+E3	-0.19 8	$\sigma(n,\gamma)=1.59 \text{ mb } 16$ (85Ra15).
2022.954 9	(6985.84)	11.4 11			$I_{\gamma}: 11 \text{ J}$ (85Ke08).
2082.681 12	(6985.84)	15.6 17			$\sigma(n,\gamma)=33.6 \text{ mb } 30$ (85Ra15).
(2129.75)	4477.60	0.146			$I_{\gamma}: 17 \text{ 2}$ (85Ke08).
2229.510 16	3801.955	2.8 3	(E1)		$\sigma(n,\gamma)=46 \text{ mb } 5$ (85Ra15).
2347.701 11	2347.781	50 5	E1 (+M2)	=0.0	$\sigma(n,\gamma)=0.43 \text{ mb}$.
2508.39 8	(6985.84)	0.38 4			$\sigma(n,\gamma)=8.4 \text{ mb } 8$ (85Ra15).
2555.492 14	4903.355	3.1 3			$I_{\gamma}: 49 \text{ 4}$ (85ke8).
2615.2‡ 2	4963.073	1.08‡ 11			$\sigma(n,\gamma)=148 \text{ mb } 13$ (85Ra15).
2616.8† 3	4189.256	0.24† 7	E1		$\sigma(n,\gamma)=1.11 \text{ mb } 12$ (85Ra15).
2716.99 16	2716.991	0.30 5			$\sigma(n,\gamma)=9.1 \text{ mb } 9$ (85Ra15).
2796.73 4	(6985.84)	5.4 5			$\sigma(n,\gamma)=3.2 \text{ mb } 3$ (85Ra15).
2905.1 4	4477.60	0.14 4			$\sigma(n,\gamma)=0.7 \text{ mb } 2$ (85Ra15).
2938.58 11	2938.64	0.89 10			$\sigma(n,\gamma)=0.89 \text{ mb } 13$ (85Ra15).
2972.0 4	4963.073	0.18 6			$I_{\gamma}: 4.3 \text{ 4}$ (85Ke08).
3139.9 5	6078.471	0.078 24			$\sigma(n,\gamma)=15.9 \text{ mb } 15$ (85Ra15).
3183.94 4	(6985.84)	6.2 6			$\sigma(n,\gamma)=0.41 \text{ mb } 11$ (85Ra15).
3330.80 4	4903.355	7.4 8	E1		$\sigma(n,\gamma)=2.62 \text{ mb } 27$ (85Ra15).
3390.55 5	4963.073	5.5 5			$\sigma(n,\gamma)=0.54 \text{ mb } 17$ (85Ra15).
3558.1 5	3558.074	0.085 17			$\sigma(n,\gamma)=0.23 \text{ mb } 7$ (85Ra15).
3801.74 3	3801.955	3.1 3	(E1)		$I_{\gamma}: 5.7 \text{ 6}$ (85Ke08).
4105.3 8	4105.6	0.047 17			$\sigma(n,\gamma)=18.2 \text{ mb } 17$ (85Ra15).
4188.96 4	4189.256	2.7 3	(E1)		$I_{\gamma}: 7.7 \text{ 8}$ (85Ke08).
4268.65 14	(6985.84)	0.34 4			$\sigma(n,\gamma)=21.8 \text{ mb } 21$ (85Ra15).
4637.91 4	(6985.84)	5.5 5			$\sigma(n,\gamma)=1.6 \text{ mb } 15$ (85Ra15).
4902.96 4	4903.355	3.7 4			$I_{\gamma}: 5.7 \text{ 6}$ (85Ke08).
4962.63 5	4963.073	2.9 3			$\sigma(n,\gamma)=0.25 \text{ mb } 5$ (85Ra15).
5752.0 8	5752.5	0.018 5			$I_{\gamma}: 2.3 \text{ 2}$ (85Ke08).
6018.2 6	6018.8	0.020 7			$\sigma(n,\gamma)=9.1 \text{ mb } 9$ (85Ra15).
6077.87 11	6078.471	0.36 4			$\sigma(n,\gamma)=0.14 \text{ mb } 5$ (85Ra15).
6293.2 4	6293.92	0.064 14			$I_{\gamma}: 24 \text{ 2}$ (85Ke08).
6355.0 6	6354.88	0.046 7			$\sigma(n,\gamma)=8.0 \text{ mb } 8$ (85Ra15).
6419.3 11	6419.9	0.016 5			$\sigma(n,\gamma)=1.00 \text{ mb } 12$ (85Ra15).
6628.5 6	6629.42	0.030 6			$I_{\gamma}: 59 \text{ 5}$ (85Ke08).
6760.3 12	6761.0	0.019 8			$\sigma(n,\gamma)=16.3 \text{ mb } 15$ (85Ra15).
6985.7 10	(6985.84)	0.036 8			$I_{\gamma}: 4.3 \text{ 4}$ (85Ke08).
					$\sigma(n,\gamma)=11.0 \text{ mb } 11$ (85Ra15).
					$I_{\gamma}: 2.9 \text{ 3}$ (85Ke08).
					$\sigma(n,\gamma)=8.6 \text{ mb } 8$ (85Ra15).
					$\sigma(n,\gamma)=0.052 \text{ mb } 15$ (85Ra15).
					$\sigma(n,\gamma)=0.06 \text{ mb } 2$ (85Ra15).
					$\sigma(n,\gamma)=1.06 \text{ mb } 11$ (85Ra15).
					$\sigma(n,\gamma)=0.19 \text{ mb } 4$ (85Ra15).
					$\sigma(n,\gamma)=0.136 \text{ mb } 20$ (85Ra15).
					$\sigma(n,\gamma)=0.048 \text{ mb } 15$ (85Ra15).
					$\sigma(n,\gamma)=0.089 \text{ mb } 16$ (85Ra15).
					$\sigma(n,\gamma)=0.056 \text{ mb } 22$ (85Ra15).
					$\sigma(n,\gamma)=0.106 \text{ mb } 23$ (85Ra15).

† After corrections due to a γ -ray of similar energy in the $^{32}\text{S}(\text{n},\gamma)^{33}\text{S}$ reaction.

‡ Peak observed at 2615.49 keV 4 with intensity 3.94 4 was reanalyzed as a doublet.

§ Absolute intensities per 100 neutron captures. For γ -ray cross section in mb (85Ra15), multiply by 2.9412 per 100 neutron captures.

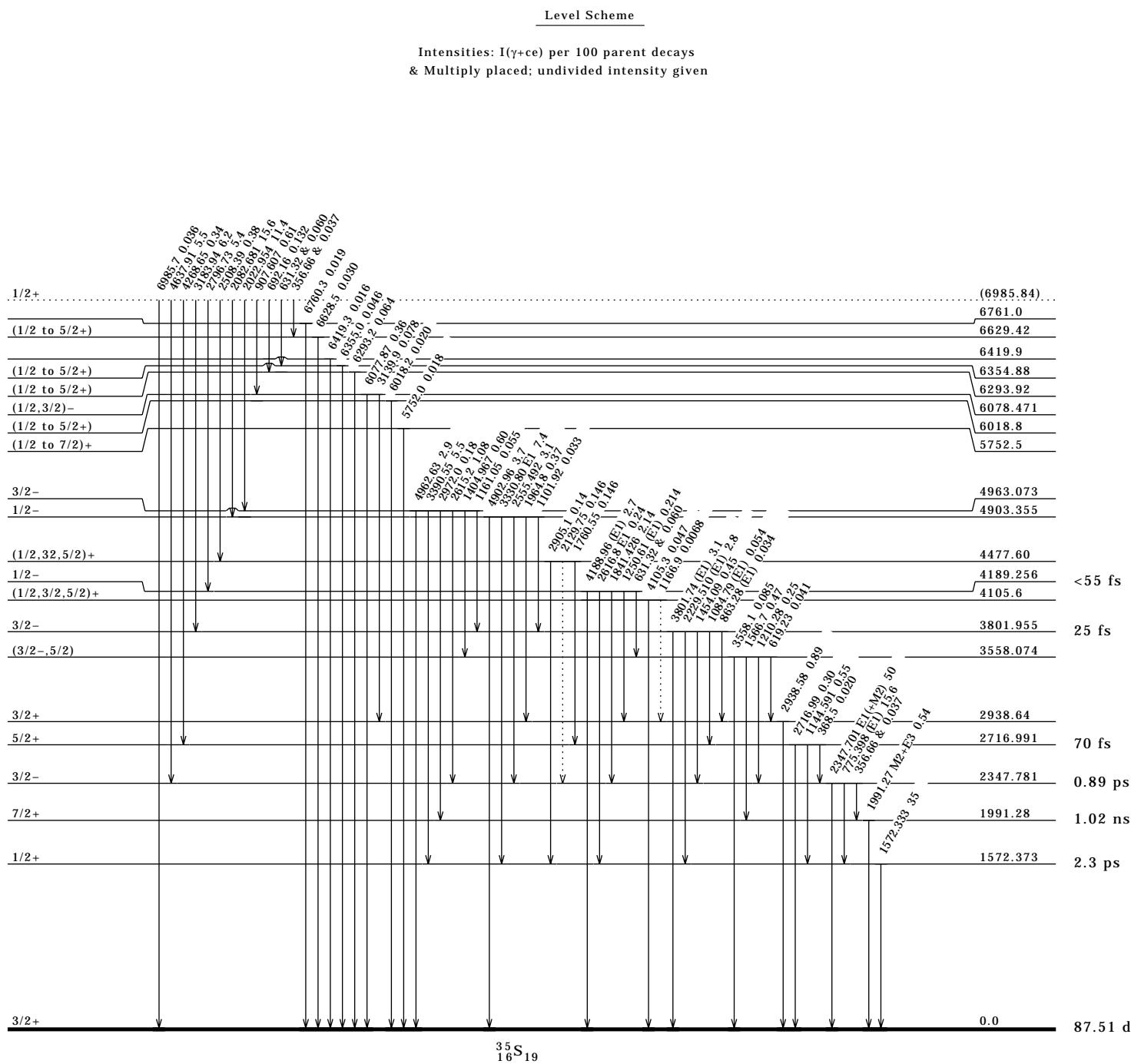
From adopted gammas, except as noted.

@ For intensity per 100 neutron captures, multiply by 1.

& Multiply placed; undivided intensity given.

x γ ray not placed in level scheme.

$^{34}\text{S}(\text{n},\gamma)$ E=thermal 85Ra15,85Ke08 (continued)



$^{35}\text{Cl}(\text{n},\gamma)$ E=thermal 82Kr12,81Ke02,96Co16Target $J\pi=3/2^+$.82Kr12: measured $E\gamma$, $I\gamma$ with curved crystal spectrometers GAMS1 and GAMS2/3 and Ge(Li)-NaI(Tl) in Compton-suppressed mode and pair spectrometer mode. Deduced neutron separation energy $S(n)=8579.68 \text{ keV}$ 9.81Ke02: measured $E\gamma$, $I\gamma$ with a Ge(Li)-NaI(Tl) pair spectrometer. Deduced neutron separation energy $S(n)=8579.83 \text{ keV}$ 2.96Co16: measured $E\gamma$, $I\gamma$ with HpGe detector.
Evaluated $S(n)=8579.70 \text{ keV}$ 7 (95Au04). **^{36}Cl Levels**

E(level) [‡]	$J\pi^\dagger$	$T_{1/2}^\dagger$	Comments
0.0	2+	$3.01 \times 10^5 \text{ yr}$	% $\beta^- = 98.10 \text{ } 10$; % $\epsilon + %\beta^+ = 1.90 \text{ } 10$.
788.441 3	3+	13.8 ps 12	
1164.886 3	1+	6.4 ps 6	
1601.113 4	1+	650 fs 40	
1951.197 3	2-	1.8 ps 2	
1959.406 4	2+	40 fs 11	
2468.278 3	3-	1.04 ps 12	
2492.319 5	2+	40 fs 11	
2518.416 6	5-	1.61 ns 8	
2676.429 13	1+	<7 fs	
2810.596 5	4-	2.8 ps 6	
2863.951 6	3+	<10 fs	
2896.341 5	3-	600 fs 100	
2994.687 7	(1, 2) -	60 fs 12	
3100.720 4	4-	150 fs 40	
3332.312 6	2-	73 fs 14	
3470.03 3	(1, 2) +	<25 fs	
3599.550 5	3-	40 fs 15	
3634.977 14	1-	20 fs 11	
3660.366 24	(1, 2, 3)		
3941.27 4	(1+ to 3+)		
3962.929 17	2-	<20 fs	
4031.95 3	(0, 1, 2) -		
4061.470 19	(1, 2) -		
4138.976 16	(2, 3) -		
4205.64 4	(1, 2) +		
4299.70 4	0+		
4315.64 8	(1, 2, 3) -		
4410.02 3	(1+ to 3+)		
4496.70 3	2-		
4525.187 19	1+		
4551.43 7	(1, 2) +		
4598.49 3	3-		
4754.36 4	(1, 2) -		
4757.996 18	3-		
4829.52 4	(1+ to 4+)		
4997.22 3	(2, 3) -		
5018.10 3	(1- to 4+)		
5079.13 4	(1, 2, 3) -		
5150.644 22	(1, 2, 3) -		
5204.56 3	2-		
5246.64 4	(1+ to 3+)		
5263.01 4	(1, 2) -		
5329.15 6	(0 to 3+)		
5463.498 20	(1, 2) -		
5473.70 5	(0+ to 3+)		
5517.692 15	3-		
5563.583 19	(2-, 3)		
5578.480 20	(1, 2) -		
5604.27 3	2+		
5703.051 25	(0+ to 4+)		
5734.045 14	(2, 3) -		
5778.55 4	(1+ to 4+)		
5956.686 24	(1, 2) +		
6042.405 21	2-		

Continued on next page (footnotes at end of table)

$^{35}\text{Cl}(\text{n},\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued) **^{36}Cl Levels (continued)**

E(level) [‡]	Jπ [†]	Comments
6089.86 4	(0- to 3)	
6184.95 5	(1, 2) +	
6253.58 4	(1, 2) -	
6268.160 17	(2-, 3)	
6339.89 4	(1, 2, 3) -	
6344.34 4	(0+ to 4+)	
6354.92 5	2+	
6379.488 20	(1, 2) +	
6423.398 18	(2, 3) -	
6487.71 4	(1, 2, 3) -	
6538.28 3	(0- to 3+)	
6544.974 17	(1, 2) +	
6604.37 3	(1- to 3)	
6642.653 22	1-	
6773.20 5	(0 to 4) +	
6836.51 4	(0- to 3)	
6952.61 4	(1, 2, 3)	
7082.70 4	(0 to 3) +	
7559.17 5	(0+ to 4+)	
(8579.70 7)	1+, 2+	E(level): 8579.70 keV γ from evaluated S(n) (95Au04). Jπ: from s-wave neutron capture. Observed deexcitation intensity is 99.7% of g.s. feeding.

[†] From adopted levels, except as noted.[‡] From Eγ's using least-squares fit to data, except as noted. **$\gamma(^{36}\text{Cl})$**

All data are from 82Kr12, except as noted.
 I_{γ} normalization: normalized from assuming $I_{\gamma}(\text{to g.s.})=100$.

E γ	E(level)	I γ ^{†#}	Mult. [§]	δ [§]	Comments
85.743 7	2896.341	0.0076 15	(M1)		
x89.838 16		0.0030 11			
x90.028 19		0.0020 10			
x108.740 32		0.0040 12			
x111.546 17		0.0050 13			
x115.424 28		0.0030 11			
x133.558 7		0.0070 23			
x137.195 30		0.0030 21			
x151.159 28		0.0030 21			
204.373 8	3100.720	0.0119 25	(M1)		
x212.726 10		0.0090 24			
225.526 36	4525.187	0.0054 17			
	6268.160	0.0037 15			
236.710 40	3100.720	0.0059 20	(E1)		
x241.334 76		0.0040 21			
x272.760 42		0.0070 32			
x279.435 42		0.0090 33			
292.178 4	2810.596	0.263 40	M1 (+E2)	+0.03 3	
302.751 74	3634.977	0.0068 36	(M1)		
x308.722 24		0.0370 82			
337.617 5	3332.312	0.0586 90	(M1)		
x340.27 15		0.0050 31			
342.311 4	2810.596	0.0175 29	(M1)		
x343.038 78		0.0080 42			
358.288 5	1959.406	0.220 36	(M1)		
369.281 29	3470.03	0.062 15			
371.562 21	4031.95	0.0044 11			
376.425 25	1164.886	0.041 11	(E2)		
x422.060 30		0.0040 12			
x427.534 13		0.0130 28			

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$^{35}\text{Cl}(\text{n},\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued) $\gamma(^{36}\text{Cl})$ (continued)

$E\gamma$	E(level)	$I\gamma^{\dagger\#}$	Mult. [§]	$\delta^{\$}$	Comments
427.855 48	5578.480	0.0319 53			
428.239 73	2896.341	0.0127 22			
435.969 10	3332.312	0.164 25	(M1)		
436.222 2	1601.113	1.05 16	(M1)		
x441.00 12		0.027 13			
x444.490 13		0.033 10			
x447.848 12		0.0070 23			
455.67 11	5473.70	0.0140 67			
x455.968 16		0.0070 23			
459.57 11	4598.49	0.0296 96			
x462.253 72		0.017 20			
463.699 18	4525.187	0.0064 52			
465.27 24	4496.70	0.0130 97			
466.06 15	5463.498	0.0163 47			
466.625 99	5018.10	0.033 16			
468.359 3	3332.312	0.089 13	(E1)		
468.765 30	4410.02	0.0099 28			
478.69 14	4138.976	0.088 50			
x485.868 35		0.0100 43			
495.891 21	6538.28	0.0095 28			
502.309 24	2994.687	0.0178 45	(E1)		
503.985 63	4138.976	0.0157 31			
508.866 2	2468.278	0.350 53	(E1)		
517.077 1	2468.278	24.3 [‡] 14	M1+E2	+0.03 1	$I\gamma$: 23.4 35 (82Kr12).
532.906 4	2492.319	0.110 18	(M1)		
537.667 41	7082.70	0.0087 30			
539.60 18	4138.976	0.0369 59			
576.417 60	6354.92	0.0042 11			
582.324 42	3100.720	0.0102 31	(M1)		
x590.495 68		0.0040 12			
x595.84 15		0.0040 12			
x602.839 43		0.0040 12			
616.152 31	6089.86	0.086 20			
619.040 62	4757.996	0.0059 18			
x622.940 48		0.0060 13			
x628.941 31		0.0090 42			
630.556 31	3962.929	0.0106 22	(M1)		
632.438 2	3100.720	0.319 48	M1+E2	+0.07 2	
640.330 33	3634.977	0.0156 29	(M1)		
656.000 84	3332.312	0.0068 16	(E1)		
x659.653 15		0.0130 28			
x661.707 11		0.0210 51			
x663.429 77		0.0050 13			
665.636 28	3660.366	0.073 16			
696.499 23	4757.996	0.0141 32			
703.204 7	3599.550	0.114 18	(M1)		
x712.107 94		0.0050 13			
717.025 25	2676.429	0.0170 37	(M1)		
x723.105 33		0.0160 38			
x727.999 27		0.0220 52			
729.106 81	4061.470	0.0064 16			
735.578 20	3599.550	0.0363 68	(E1)		
760.365 51	5778.55	0.0238 58			
780.66 68	6253.58	0.012 15			
786.305 2	1951.197	10.52 [‡] 35	(E1)		$I\gamma$: 11.2 17 (82Kr12).
788.432 3	788.441	16.32 [‡] 36	M1+E2	+1.1 2	$I\gamma$: 16.9 25 (82Kr12), 15.0 (81Ke02).
812.608 22	1601.113	0.068 11	(E2)		
x832.080 22		0.100 24			
841.901 23	6544.974	0.0384 84			
x848.449 55		0.0300 75			
859.420 12	2810.596	0.106 18	E2 (+M3)	-0.01 4	
864.021 8	3332.312	0.122 20	(M1)		
x865.395 73		0.0200 50			

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$^{35}\text{Cl}(\text{n},\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued) $\gamma(^{36}\text{Cl})$ (continued)

E_γ	$E(\text{level})$	$I_\gamma^{\dagger\#}$	Mult. [§]	$\delta^\$$	Comments
870.484 68	6604.37	0.0156 30			
x884.87 12		0.0190 76			
x886.795 60		0.0170 65			
904.508 25	2863.951	0.0469 76			
x912.881 16		0.096 22			
936.921 5	2896.341	0.589 88	(E1)		
945.131 14	2896.341	0.139 24			
x946.297 85		0.0240 79			
958.559 28	3634.977	0.057 11	(E1)		
968.173 53	3962.929	0.0317 68	(M1)		
975.74 12	5734.045	0.0172 39			
979.615 50	5734.045	0.0337 68			
x989.634 56		0.041 13			
998.801 94	4598.49	0.0334 60			
1020.497 51	(8579.70)	0.073 11			
1034.261 23	4997.22	0.323 50			
x1035.125 25		0.123 27			
x1035.892 92		0.059 14			
1043.473 24	2994.687	0.099 16			
1066.723 63	3962.929	0.088 16	(M1)		
x1068.72 13		0.039 12			
1076.723 47	5018.10	0.0317 65			
1086.662 36	6604.37	0.069 12			
1089.43 17	5150.644	0.0331 98			
x1095.72 29		0.0170 65			
x1127.81 20		0.038 11			
1131.247 5	3599.550	1.911 [‡] 56	(M1)		I_γ : 1.91 29 (82Kr12).
1162.785 16	1951.197	2.29 34	(E1)		
1164.874 4	1164.886	27.20 [‡] 72	M1+E2	-0.32 6	I_γ : 27.7 42 (82Kr12).
1170.922 19	1959.406	0.510 76			
1201.98 12	5517.692	0.116 18			
1230.846 52	5263.01	0.101 16			
1258.028 59	6836.51	0.060 12			
1264.60 13	3941.27	0.067 15			
1265.42 11	6344.34	0.083 15			
1327.418 10	2492.319	1.27 19	M1+E2	-0.10 7	
1372.855 26	3332.312	0.384 59	(E1)		
1381.98 21	6379.488	0.0413 86			
1425.43 11	4757.996	0.071 12			
1496.702 77	(8579.70)	0.171 27			
1510.75 15	3470.03	0.150 25	(M1)		
1515.626 80	5150.644	0.077 15			
1517.056 80	6042.405	0.077 15			
1524.99 20	6604.37	0.080 15			
1526.26 47	6544.974	0.133 26			
1528.61 15	5734.045	0.121 20			
1601.082 7	1601.113	3.484 [‡] 89			I_γ : 3.48 35 (82Kr12), 3.82 45 (81Ke02).
x1605.99 15		0.061 12			
1623.32 20	4299.70	0.105 13	M1		
1626.985 43	(8579.70)	0.298 31			
1640.116 17	3599.550	0.427 43	(E1)		
1648.305 15	3599.550	0.524 53			
1657.254 29	4757.996	0.236 24			
1679.761 29	2468.278	0.201 21			
1683.808 32	3634.977	0.225 23			
1709.83 34	3660.366	0.209 22			
1729.935 50	2518.416	0.344 40	M2+E3	-0.11 1	
1731.155 50	3332.312	0.219 30	(E1)		
1743.148 43	(8579.70)	0.249 26			
x1786.18 10		0.217 35			
1788.059 60	4598.49	0.374 41			
1806.421 69	(8579.70)	0.159 18			
1828.501 18	5463.498	0.368 37			

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$^{35}\text{Cl}(\text{n},\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued) $\gamma(^{36}\text{Cl})$ (continued)

E_γ	E(level)	$I_\gamma^{\dagger\#}$	Mult. [§]	$\delta^\$$	Comments
1858.089 29	6268.160	0.289 29			
1936.961 20	(8579.70)	0.430 43			
1951.145 8	1951.197	19.39 [‡] 57	E1 (+M2)	-0.10 10	I_γ : 20.2 20 (82Kr12), 20.39 76 (81Ke02).
1959.358 14	1959.406	12.56 [‡] 28			I_γ : 12.9 13 (82Kr12), 13.41 58 (81Ke02).
1975.61 29	(8579.70)	0.694 70			
x1996.330 53		0.242 36			
2003.446 36	3962.929	0.203 21			
2011.760 63	3962.929	0.116 13	(E1)		
2022.098 16	2810.596	0.518 52	E1+M2	-0.14 3	
2034.634 16	(8579.70)	0.748 75			
2041.15 13	(8579.70)	0.593 63			
2075.547 28	2863.951	0.369 40			
2091.891 40	(8579.70)	0.206 21			
2110.247 75	4061.470	0.202 21			
2133.22 18	4997.22	0.0591 92			
2156.213 18	(8579.70)	0.679 68			
2179.529 25	4138.976	0.266 27			
2200.118 19	(8579.70)	0.391 39			
2224.684 53	(8579.70)	0.165 18			
2229.966 50	7559.17	0.0615 80			
2231.312 50	5563.583	0.348 40			
2235.363 48	(8579.70)	0.190 20			
2239.713 38	(8579.70)	0.242 25			
2246.213 46	4205.64	0.194 20			
2254.258 70	5150.644	0.237 25			
2265.79 11	4757.996	0.0624 88			
2282.861 47	6344.34	0.140 15			
2289.887 60	4757.996	0.483 53			
2311.406 19	(8579.70)	1.09 11			I_γ : 0.99 9 (81Ke02).
2326.025 38	(8579.70)	0.234 24			
2342.27 20	6642.653	0.0417 85			
2355.89 14	4315.64	0.117 16			
2364.65 16	4315.64	0.0585 81			
2382.71 11	5246.64	0.149 18			
2394.636 52	(8579.70)	0.156 17			
2407.284 33	6042.405	0.195 20			
x2418.553 30		0.551 79			
2429.538 90	6089.86	0.166 20			
2467.72 12	2468.278	0.287 36			
2469.879 46	3634.977	0.731 76	(E1)		
2489.850 69	(8579.70)	0.455 52			
(2492.233)	2492.319	0.14 4			
x2494.831 80		0.207 31			
(2518.327)	2518.416	0.019 2	E3 (+M4)	=0.0	
2524.67 11	6487.71	0.110 13			
2527.944 50	5204.56	0.246 26			
2537.255 [®] 50	4496.70	0.437 [®] 46			
	(8579.70)	0.437 [®] 46			
2549.81 15	5018.10	0.291 49			
2567.462 87	6773.20	0.172 19			
2569.88 21	5246.64	0.070 12			
2622.880 24	(8579.70)	0.633 64			
2639.057 88	4598.49	0.155 18			
2647.60 35	4598.49	0.278 29			
2653.49 19	5517.692	0.072 11			
2662.91 12	6604.37	0.111 14			
2676.300 20	2676.429	1.572 [‡] 38			I_γ : 1.91 19 (82Kr12), 2.06 11 (81Ke02).
2682.398 87	5150.644	0.158 18			
2698.62 12	4299.70	0.0567 74	M1		
2711.618 98	6773.20	0.0865 99			
x2727.887 66		0.135 15			
2740.62 32	5604.27	0.127 49			
2753.01 13	5563.583	0.111 14			

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$^{35}\text{Cl}(\text{n},\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued) $\gamma(^{36}\text{Cl})$ (continued)

$E\gamma$	E(level)	$I\gamma^{\dagger\#}$	Mult. [§]	Comments
2797.986 95	3962.929	0.294 33	(E1)	
	6268.160	0.294 33		
2800.846 71	(8579.70)	0.827 86		
2811.011 35	3599.550	0.482 49	(E1)	
2845.498 12	(8579.70)	1.27 13		$I\gamma$: 1.22 7 (81Ke02).
2863.815 16	2863.951	5.77 [‡] 11		$I\gamma$: 6.55 66 (82Kr12), 6.63 21 (81Ke02).
2867.16 30	4031.95	0.615 87		
x2871.407 96		0.311 48		
2876.640 55	(8579.70)	0.563 61		
2896.232 16	2896.341	0.553 56	(E1)	
2941.331 88	6042.405	0.129 14		
2953.23 10	6423.398	0.0635 82		
2955.12 10	5473.70	0.0717 88		
2975.235 31	(8579.70)	1.046 [‡] 25		$I\gamma$: 1.21 12 (82Kr12).
2994.707 6	2994.687	0.91 11	(E1)	$I\gamma$: 0.90 6 (81Ke02).
3001.067 21	(8579.70)	0.697 36		$I\gamma$: 0.71 5 (81Ke02).
3015.985 19	(8579.70)	1.131 58		$I\gamma$: 1.13 7 (81Ke02).
3025.24 31	5517.692	0.0594 95		
3040.23 42	4205.64	0.0442 97		
3061.865 22	(8579.70)	3.521 [‡] 66		$I\gamma$: 3.88 20 (82Kr12), 4.01 14 (81Ke02).
3067.84 20	6538.28	0.176 17		
3086.28 29	5578.480	0.088 13		
3105.76 16	(8579.70)	0.169 16		
3116.216 43	(8579.70)	0.994 55		$I\gamma$: 1.05 6 (81Ke02).
(3134.66)	4299.70	0.03 2	M1	
3135.33 15	5604.27	0.1158 99		
3151.79 24	3941.27	0.0583 73		
x3203.79 27		0.0750 97		
3210.59 20	5703.051	0.0584 77		
3244.36 16	4410.02	0.0988 88		
3250.357 77	(8579.70)	0.255 15		
x3255.70 44		0.0370 72		
3271.48 17	6604.37	0.1005 98		
3291.88 25	6952.61	0.094 14		
3295.85 28	5246.64	0.092 14		
3311.71 23	5263.01	0.0435 49		
3316.363 47	(8579.70)	0.257 14		
3333.09 10	(8579.70)	0.827 44		$I\gamma$: 0.84 5 (81Ke02).
3349.747 94	4138.976	0.238 16		
3374.895 46	(8579.70)	0.600 33		$I\gamma$: 0.64 4 (81Ke02).
3385.53 42	4551.43	0.0421 82		
3428.863 29	(8579.70)	0.895 46		$I\gamma$: 0.90 5 (81Ke02).
x3435.89 12		0.134 12		
3457.44 20	6268.160	0.0512 86		
3458.40 20	6354.92	0.0328 84		
3470.06 14	3470.03	0.1003 79		
3489.73 87	6354.92	0.0118 58		
3500.378 57	(8579.70)	0.330 18		
3504.166 86	6836.51	0.199 13		
3512.21 12	5463.498	0.0772 59		
3526.85 12	6423.398	0.0748 59		
3558.23 24	5517.692	0.172 25		
3561.258 79	(8579.70)	0.693 42		
3566.611 73	5517.692	0.310 18		$I\gamma$: 0.24 2 (81Ke02).
3581.90 16	(8579.70)	0.133 14		
3589.234 50	4754.36	0.605 34		$I\gamma$: 0.48 3 (81Ke02).
3599.251 65	3599.550	0.539 31	(E1)	$I\gamma$: 0.51 3 (81Ke02).
3604.112 82	5563.583	0.401 25		$I\gamma$: 0.39 3 (81Ke02).
3612.62 18	5563.583	0.109 11		
3621.67 19	4410.02	0.117 11		
3627.27 18	5578.480	0.127 12		
3634.480 73	3634.977	0.334 21	(E1)	$I\gamma$: 0.31 2 (81Ke02).
3645.58 34	5246.64	0.0404 67		

Continued on next page (footnotes at end of table)

$^{35}\text{Cl}(\text{n},\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued) $\gamma(^{36}\text{Cl})$ (continued)

E_γ	E(level)	$I_\gamma^{\dagger \#}$	Mult. [§]	Comments
3660.23 16	3660.366	0.209 22		
3707.824 61	4496.70	0.182 11		
3728.20 20	5329.15	0.0438 54		
3736.541 56	4525.187	0.197 11		
3743.77 11	5703.051	0.0958 68		
3749.905 44	(8579.70)	0.309 17		I γ : 0.34 3 (81Ke02).
(3751.74)	5703.051	0.08 2		
3809.63 28	4598.49	0.0508 78		
3821.581 42	(8579.70)	1.095 58		I γ : 1.08 5 (81Ke02).
3825.53 36	(8579.70)	0.842 46		I γ : 0.84 4 (81Ke02).
x3860.18 11		0.1070 88		
3916.37 17	5517.692	0.0685 57		
3962.60 15	3962.929	0.367 36	(E1)	I γ : 0.41 3 (81Ke02).
3977.24 28	5578.480	0.126 17		
3981.064 46	(8579.70)	1.028 55		I γ : 1.04 5 (8ke02).
3997.14 29	5956.686	0.0687 86		
4028.054 93	(8579.70)	0.193 13		
4041.08 18	4829.52	0.0845 82		
4054.226 41	(8579.70)	0.626 33		I γ : 0.65 3 (81Ke02).
4061.048 83	4061.470	0.242 15		
4082.664 42	(8579.70)	0.785 41		
4086.62 50	7082.70	0.063 11		
4091.50 55	6042.405	0.0302 61		
4097.90 40	5263.01	0.0285 51		
4111.76 12	6604.37	0.1003 77		
4138.456 76	6089.86	0.372 22		I γ : 0.32 2 (81Ke02).
x4148.6 11		0.0110 50		
4164.17 23	5329.15	0.0767 76		
4169.20 39	(8579.70)	0.0576 74		
4173.79 84	6642.653	0.0205 64		
x4192.30 28		0.0270 42		
4205.14 13	4205.64	0.1232 78		
4264.01 36	(8579.70)	0.0307 45		
4294.58 51	6253.58	0.0424 94		
4298.384 67	5463.498	0.389 22		I γ : 0.42 3 (81Ke02).
4308.28 41	5473.70	0.0427 72		
4355.00 10	5956.686	0.1459 94		
4413.59 25	5578.480	0.175 33		
4416.11 48	5204.56	0.122 29		
4420.60 50	6379.488	0.0363 71		
4440.399 23	(8579.70)	1.047 [‡] 23		I γ : 1.085 55 (82Kr12), 1.11 4 (81Ke02).
4458.20 11	5246.64	0.1058 73		
x4473.33 30		0.0270 42		
4518.12 10	(8579.70)	0.155 10		
4524.866 45	4525.187	0.459 24		I γ : 0.47 3 (81Ke02).
4547.473 69	(8579.70)	0.453 26		I γ : 0.47 3 (81Ke02).
4551.41 22	4551.43	0.131 13		
x4558.08 88		0.0150 51		
4586.602 66	6538.28	0.272 15		
x4591.85 35		0.0480 65		
4597.50 26	4598.49	0.0483 52		
4616.436 35	(8579.70)	0.682 35		I γ : 0.71 3 (81Ke02).
4637.59 71	(8579.70)	0.0139 47		
4652.90 29	6253.58	0.0297 40		
x4683.51 16		0.0580 58		
4728.966 31	5517.692	0.702 36		I γ : 0.73 3 (81Ke02).
x4747.14 30		0.0360 44		
4753.31 16	6354.92	0.1235 90		
4757.48 14	4757.996	0.1365 95		
4791.44 31	5956.686	0.0280 39		
4815.297 77	5604.27	0.1542 92		
4829.064 64	4829.52	0.194 11		I γ : 0.21 2 (81Ke02).
4884.85 12	6836.51	0.0928 64		

Continued on next page (footnotes at end of table)

$^{35}\text{Cl}(\text{n},\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued) $\gamma(^{36}\text{Cl})$ (continued)

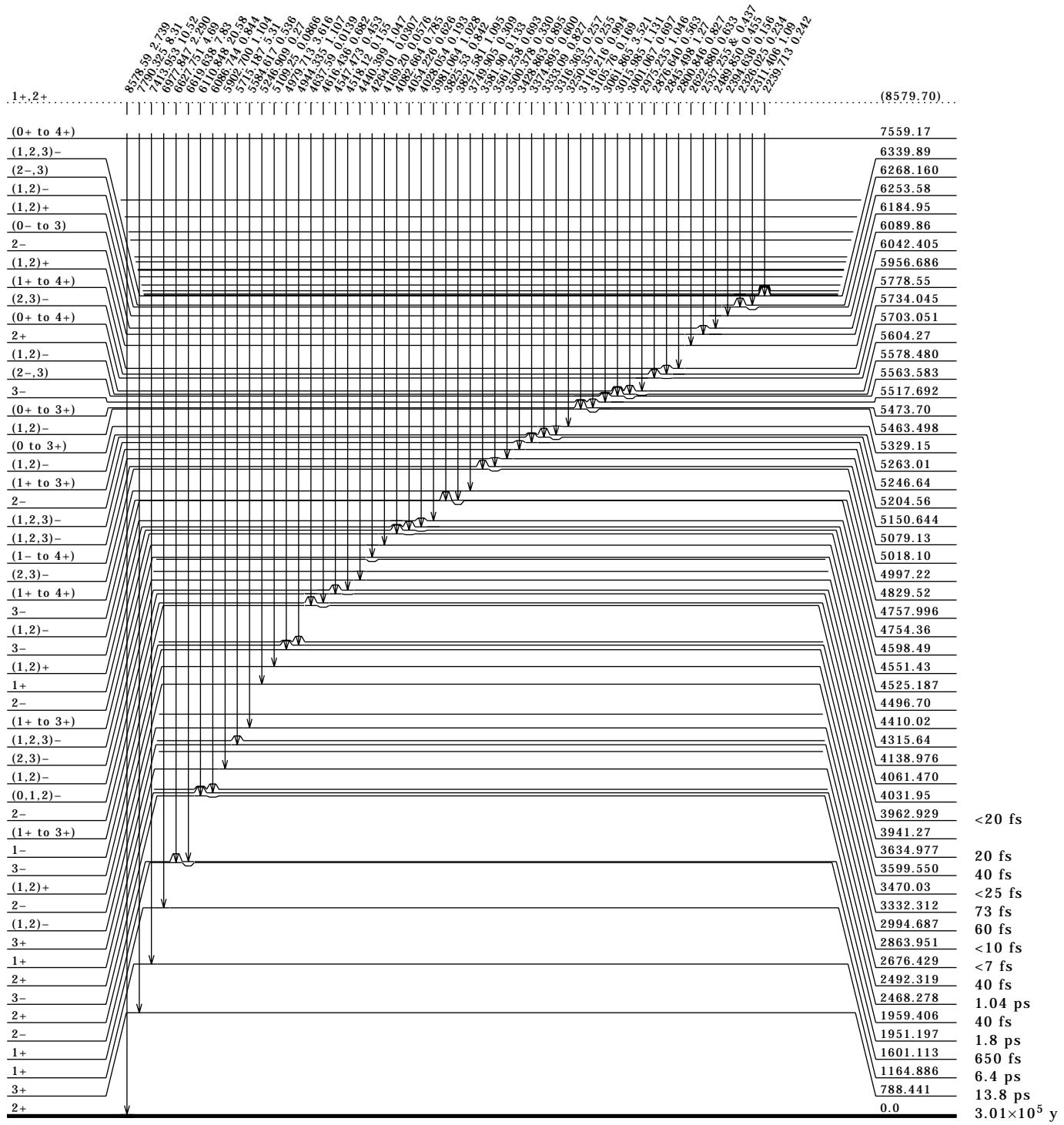
E_γ	E(level)	$I_\gamma^{\dagger \#}$	Comments
4944.335 50	(8579.70)	1.107 75	I_γ : 1.19 4 (81Ke02).
4945.195 50	5734.045	0.635 60	
x4950.85 19		0.159 16	
4979.713 25	(8579.70)	3.616 \ddagger 96	I_γ : 3.60 18 (82Kr12), 3.95 10 (81Ke02).
4989.96 12	5778.55	0.309 19	
5000.55 34	6952.61	0.0459 73	
5017.726 54	5018.10	0.465 25	I_γ : 0.52 3 (81Ke02).
5078.818 65	5079.13	0.1520 86	I_γ : 0.16 1 (81Ke02).
5088.05 22	6253.58	0.0377 40	
5109.25 13	(8579.70)	0.0866 65	I_γ : 0.09 1 (81Ke02).
5122.82 30	7082.70	0.0346 45	
x5142.12 16		0.0720 70	
5150.195 67	5150.644	0.202 11	I_γ : 0.23 2 (81Ke02).
5204.230 66	5204.56	0.205 12	I_γ : 0.22 2 (81Ke02).
5246.189 50	5246.64	0.27 10	
5246.909 50	(8579.70)	0.27 10	I_γ : 0.59 3 (81Ke02).
5262.76 17	5263.01	0.0985 76	
5372.35 25	6538.28	0.0494 51	
5473.34 20	5473.70	0.0857 74	
5517.202 26	5517.692	1.689 \ddagger 42	I_γ : 1.707 87 (82Kr12), 1.75 5 (81Ke02).
5584.617 38	(8579.70)	0.536 28	I_γ : 0.52 2 (81Ke02).
5603.867 52	5604.27	0.358 19	I_γ : 0.36 2 (81Ke02).
5634.38 24	6423.398	0.0570 57	
5702.63 14	5703.051	0.431 30	I_γ : 0.39 2 (81Ke02).
5715.187 26	(8579.70)	5.31 \ddagger 15	I_γ : 5.60 28 (82Kr12), 5.68 12 (81Ke02).
5733.48 16	5734.045	0.510 37	I_γ : 0.46 2 (81Ke02).
5777.45 34	5778.55	0.123 17	I_γ : 0.15 1 (81Ke02).
5902.700 27	(8579.70)	1.104 \ddagger 31	I_γ : 11.132 57 (82Kr12), 1.18 4 (81Ke02).
5956.294 93	5956.686	0.191 11	I_γ : 0.20 1 (81Ke02).
x6051.16 26		0.0420 45	
6086.744 43	(8579.70)	0.844 44	I_γ : 0.94 3 (81Ke02).
6110.848 38	(8579.70)	20.58 \ddagger 65	I_γ : 20.2 10 (82Kr12), 20.96 33 (81Ke02).
6184.33 13	6184.95	0.0818 59	I_γ : 0.10 1 (81Ke02).
6252.99 18	6253.58	0.0748 62	
6267.810 46	6268.160	0.441 23	I_γ : 0.43 2 (81Ke02).
6339.72 29	6339.89	0.0726 86	
6343.88 36	6344.34	0.0597 82	
6378.945 71	6379.488	0.199 11	I_γ : 0.21 1 (81Ke02).
6422.845 56	6423.398	0.278 15	I_γ : 0.29 2 (81Ke02).
6487.040 82	6487.71	0.1373 80	I_γ : 0.13 1 (81Ke02).
6544.112 81	6544.974	0.1535 87	I_γ : 0.14 1 (81Ke02).
6619.638 44	(8579.70)	7.83 \ddagger 16	I_γ : 7.80 39 (82Kr12), 8.31 16 (81Ke02).
6627.751 59	(8579.70)	4.69 \ddagger 11	I_γ : 4.83 24 (82Kr12), 4.74 10 (81Ke02).
6641.98 46	6642.653	0.186 32	
6951.807 74	6952.61	0.1578 88	I_γ : 0.15 1 (81Ke02).
6977.847 47	(8579.70)	2.290 \ddagger 64	I_γ : 2.32 12 (82Kr12), 2.40 6 (81Ke02).
x7377.38 41		0.0310 43	
7413.953 65	(8579.70)	10.52 \ddagger 24	I_γ : 10.36 52 (82Kr12), 10.69 19 (81Ke02).
7558.21 43	7559.17	0.0230 35	
7790.325 64	(8579.70)	8.31 \ddagger 19	I_γ : 8.48 42 (82Kr12), 8.69 16 (81Ke02).
8578.59 11	(8579.70)	2.739 \ddagger 57	I_γ : 2.78 14 (82Kr12), 2.84 7 (81Ke02).

[†] Absolute intensities per 100 neutron captures.[‡] From 96Co16.[§] From adopted gammas.[#] For intensity per 100 neutron captures, multiply by 1.[@] Multiply placed; undivided intensity given.^x γ ray not placed in level scheme.

³⁵Cl(n, γ) E=thermal 82Kr12,81Ke02,96Co16 (continued)

Level Scheme

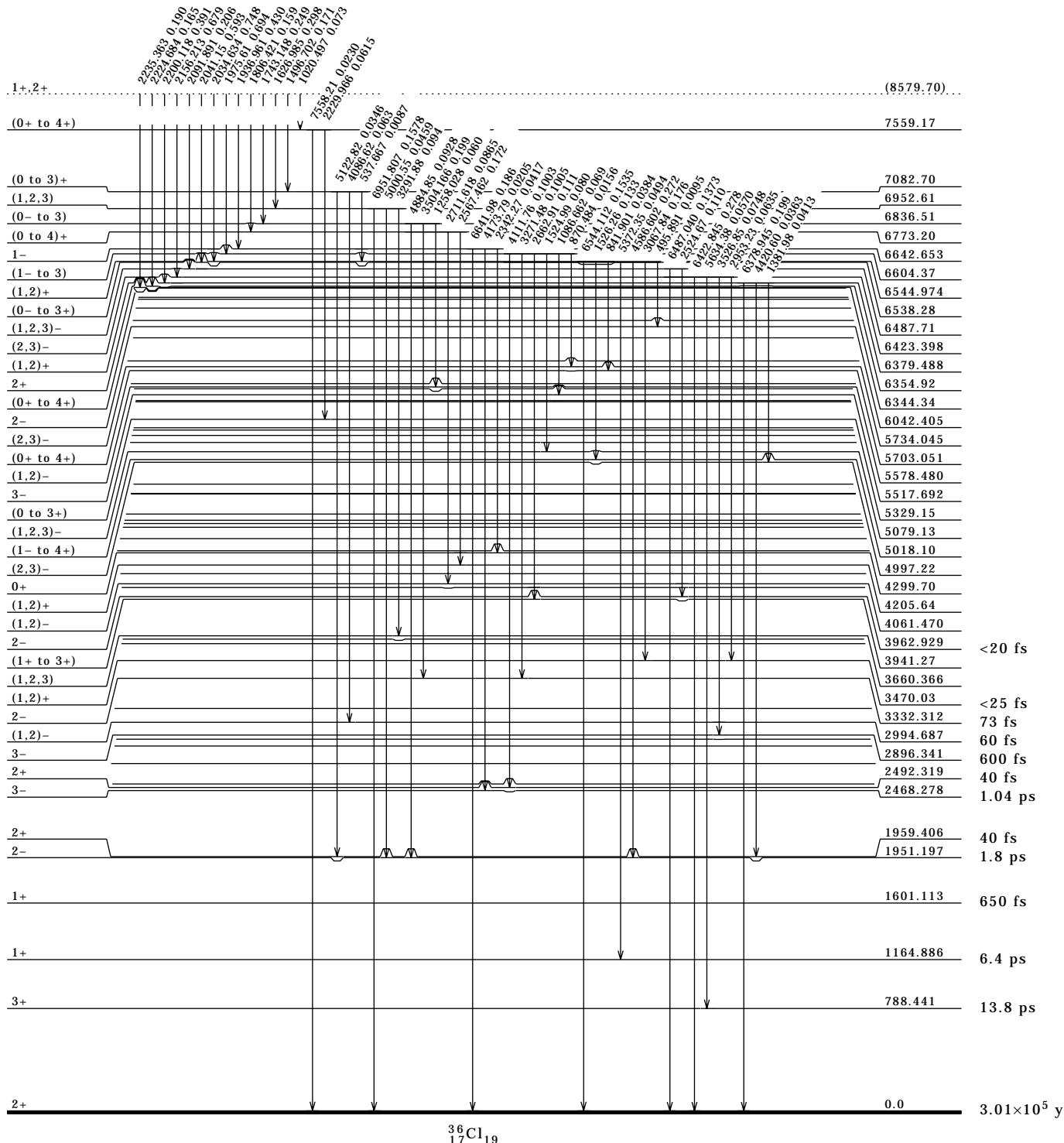
Intensities: $I(\gamma + ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



³⁵Cl(n, γ) E=thermal 82Kr12,81Ke02,96Co16 (continued)

Level Scheme (continued)

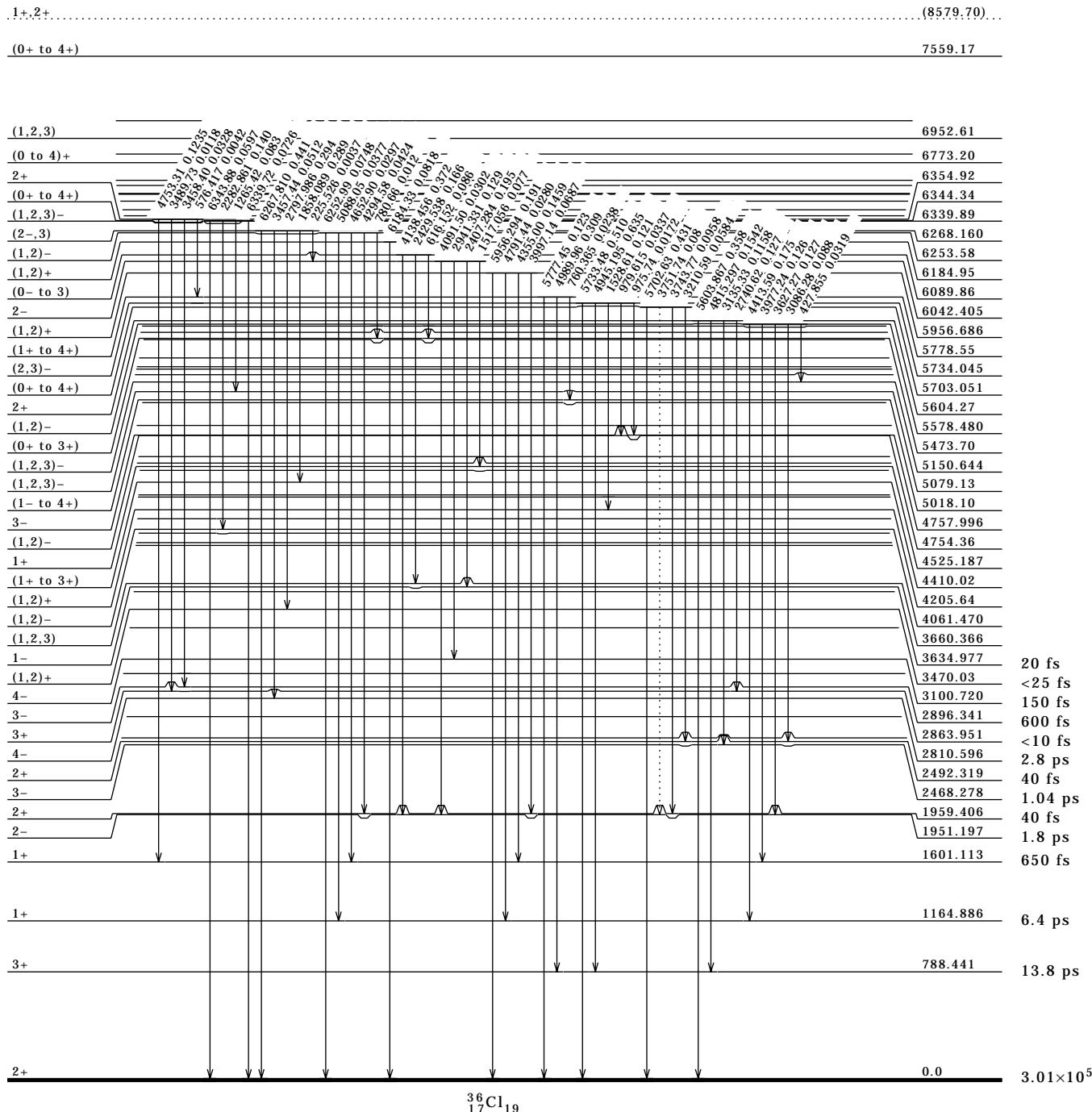
Intensities: $I(\gamma + ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{35}\text{Cl}(n,\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued)

Level Scheme (continued)

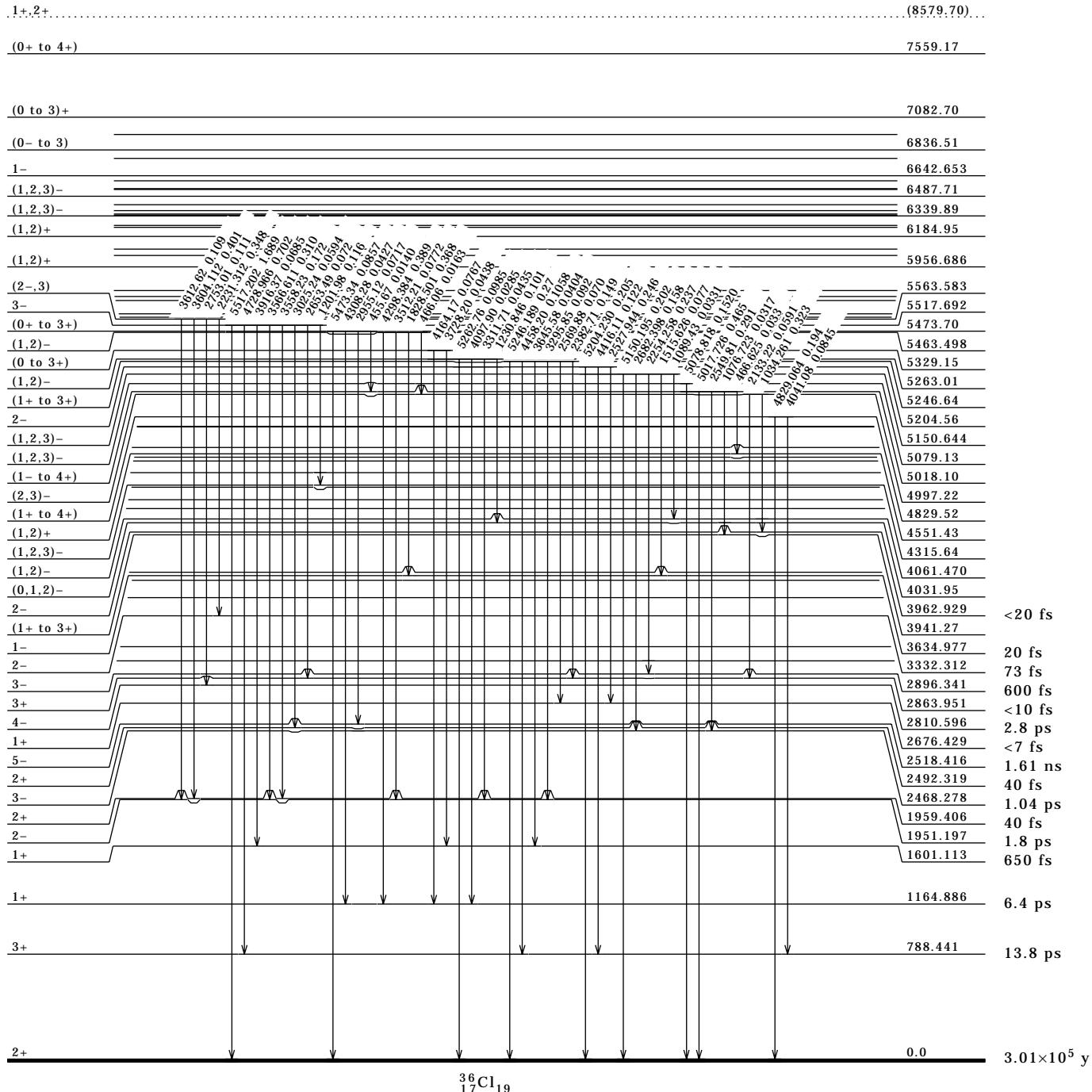
Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{35}\text{Cl}(n,\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued)

Level Scheme (continued)

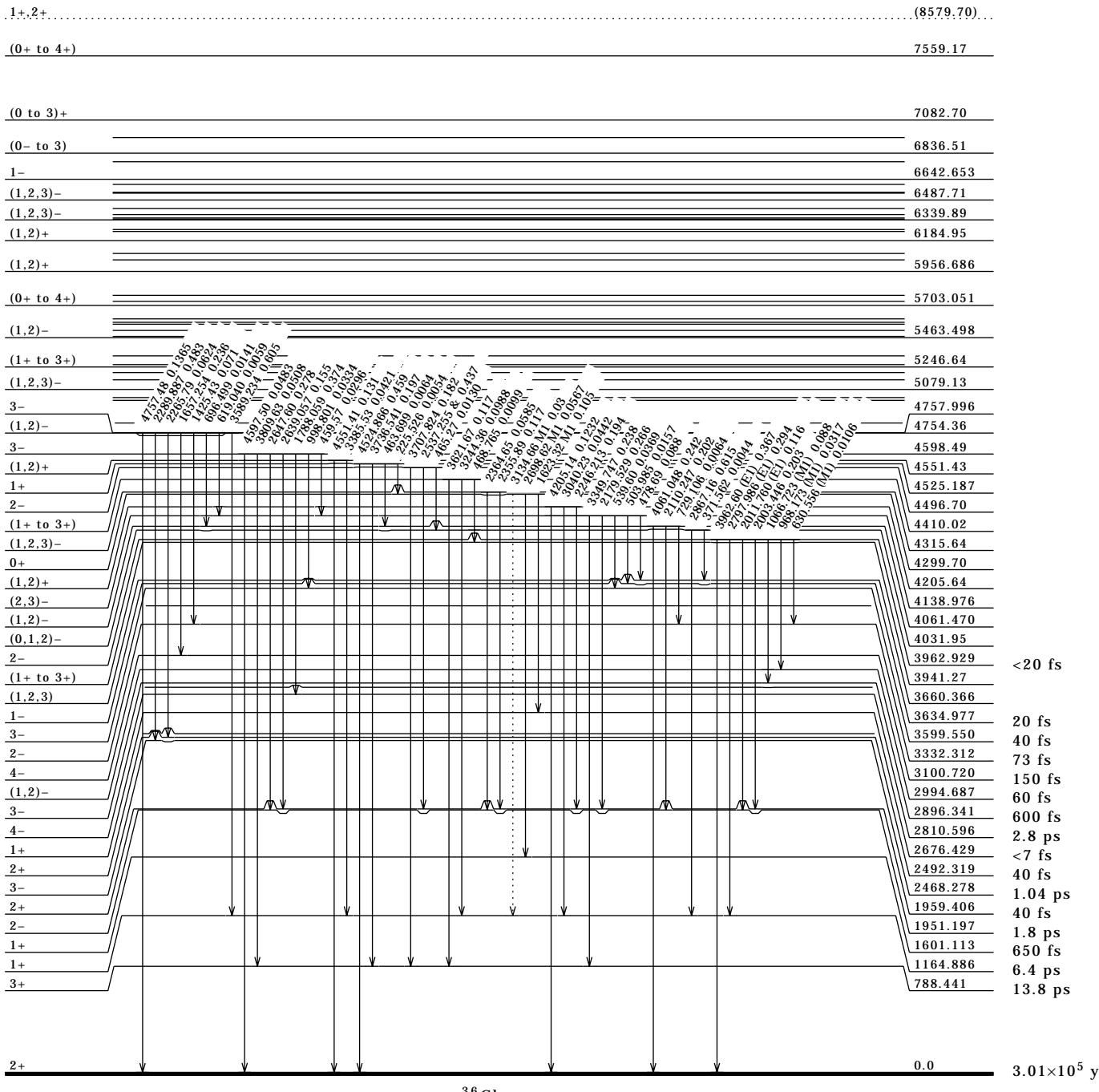
Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



³⁵Cl(n, γ) E=thermal 82Kr12,81Ke02,96Co16 (continued)

Level Scheme (continued)

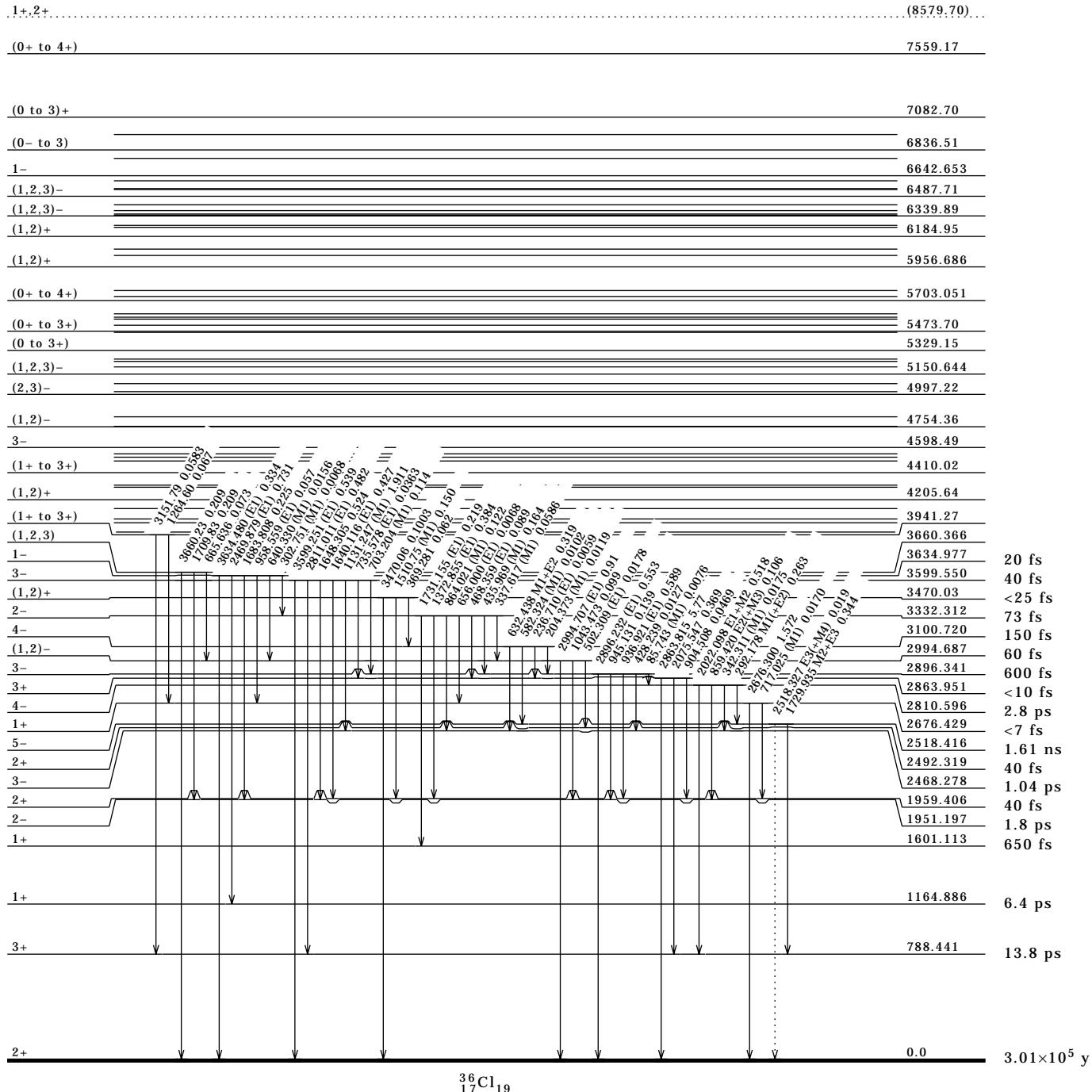
Intensities: $I(\gamma + ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



$^{35}\text{Cl}(n,\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued)

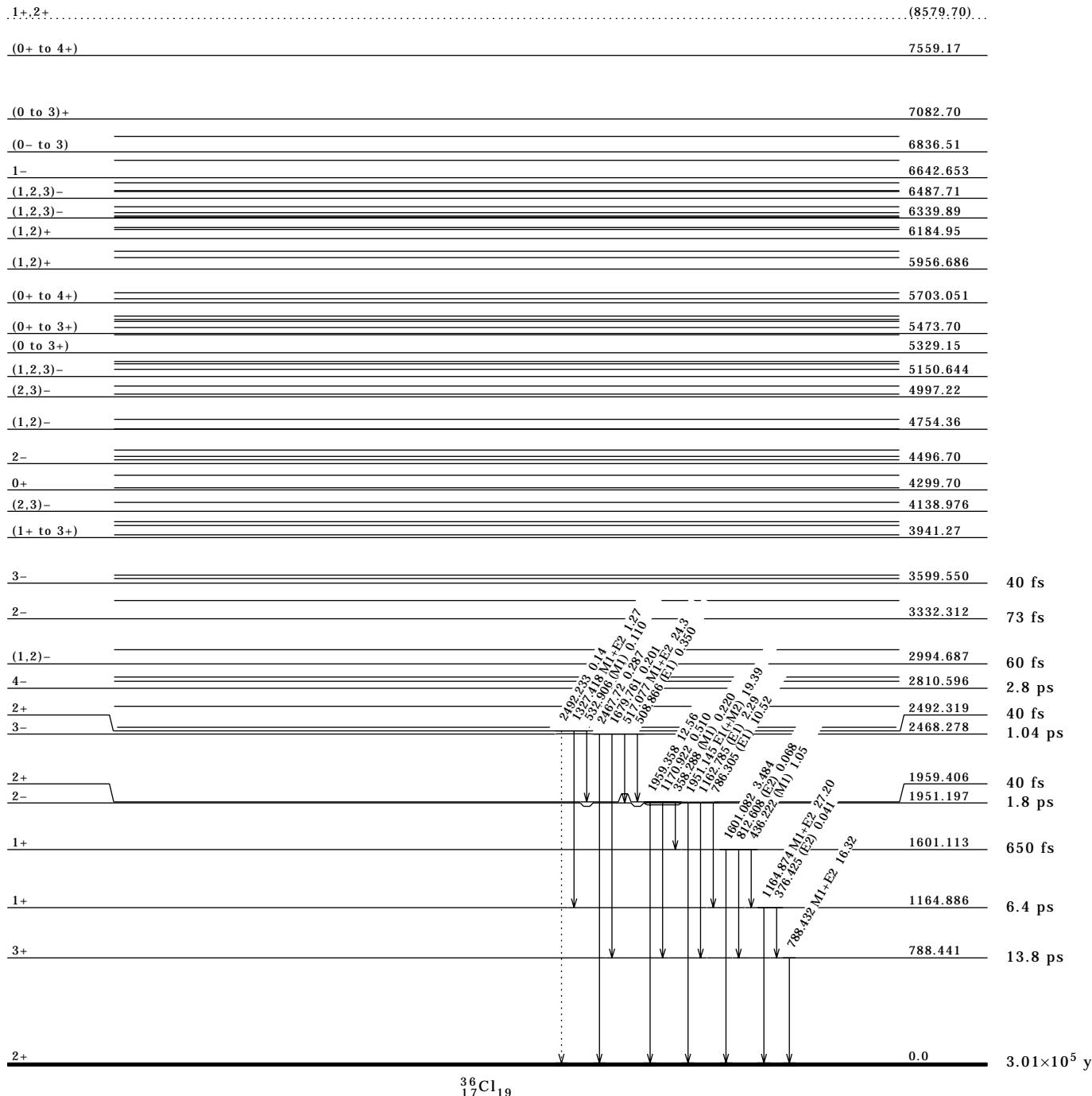
Level Scheme (continued)

Intensities: $I(\gamma+ce)$ per 100 parent decays
& Multiply placed; undivided intensity given



$^{35}\text{Cl}(n,\gamma)$ E=thermal 82Kr12,81Ke02,96Co16 (continued)Level Scheme (continued)

Intensities: $I(\gamma+ce)$ per 100 parent decays
 & Multiply placed; undivided intensity given



References of Thermal-Neutron Capture Data for A=26-35

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